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ORIGINAL ARTICLES.

STUDIES ON THE ACTION OF ALCOHOL IN DISEASE, ESPECIALLY UPON THE CIRCULATION.*

BY RICHARD C. CABOT, M.D.,
of Boston, Mass.

PERHAPS no subject has been more frequently or more heatedly discussed during the last few years than the action and value of alcohol. We have had two interesting symposia upon the subject in Boston within a year, and many similar discussions are reported in domestic and foreign journals. One might think, therefore, that the subject was about threshed out and that nothing new could be said about it, but as one looks over the reports of these discussions one fact is very striking, and that is the scarcity of experimental evidence regarding the action of alcohol in diseased human beings.

In the discussions to which I have referred, the disputants have usually ranged themselves in two parties, those favoring the use of alcohol on one side and those opposed to its use on the other. Those who favor its use usually do so on the ground of their general impression that it has done good in cases under their observation. Those opposed to the use of alcohol usually refer to a number of experiments, for the most part not very recent ones, upon the action of the drug in the lower animals. But very rarely has any one anything to say about experiments or measurements of the action of the drug upon any of the functions of the diseased human being. The "advocates of alcohol" say that it does good, but if you ask them: *What* good does it do? Does it decrease temperature? Does it improve sleep? Does it slow or strengthen the heart's action, and if so how much?—they have rarely anything to answer. On the other hand, if you ask the "opponents of alcohol" what harm it does, they will point to the effect produced on a dog or a rabbit by doses of alcohol which would correspond to giving a man a quart of whisky at a drink, or they will refer you to experiments on healthy soldiers or typewriters. The use of such evidence assumes that alcohol acts in the same way in all animals, whereas we know well that its action in mammals is very different from its action in birds, and have by no means proved what is true of its action in dogs or rabbits is true of its use in man. Another common assumption is that the effects of alcohol in disease are similar to its effects in health. But this is a totally unproved assumption, and there is, I think, a good deal of evidence that it is not true.

It seems to me, therefore, that there is a real need for exact, experimental evidence regarding the action of alcohol in sickness, and it is to this problem that I have addressed myself. I have not sought to show that alcohol does good or that it does harm. I have rather tried to find out *what it does*, what its effect is upon temperature, upon the heart and pulse, upon the rapidity of the respiration, upon the amount of urine, upon the sweat, upon the appearance of the tongue, upon the appetite and upon the cerebral condition of the patient as shown in the amount he sleeps, in the effect of the drug upon delirium, and upon his spirits so far as could be ascertained by talking with him.

I will not deny that I have approached the subject with a marked bias, but I hasten to add that I have done all I could to prevent this bias from influencing my observations. That I have succeeded, at least to some extent, is evidenced, I think, by the fact that my results have not come out at all as I expected and indeed hoped that they would.

In order to counteract so far as possible the bad effects of my prejudices, I have recorded each of my observations on separate slips of paper without allowing myself to refer to the chart in which they were later recorded. As I could not retain in memory the records of the individual patients, and did not allow myself to be reminded of them by looking in the chart, I was thus unable to influence the readings in the direction of my expectations, as I previously found it very tempting to do.

In the study of the effects of alcohol on temperature, appetite, sleep, etc., I have circumvented my bias by getting nurses, who had no idea of what I had in mind, to record the data for me on blanks provided for the purpose.

I have said that there was a dearth of experimental evidence regarding the action of alcohol in diseased persons, but this lack is much more striking in certain directions than in others. Certain points have, I think, been pretty well cleared up, while others are still obscure. Hence it may not be out of place to sum up what may be regarded as relatively settled, in order that the unexplored regions may be made more evident by contrast.

About the food value and the digestive action of alcohol, about its effect on temperature, respiration, the secretions and the susceptibility of the lower animals to infection, there is a good deal that we may consider settled.

On the other hand, there are very few experiments upon its action on the *circulation* of the sick, or upon the protective powers of the human blood against infection.

These two problems, then, confront us:

(1) What effect has alcohol upon the circulation in sick persons?

* Read before the Association of American Physicians, May 13, 1903.

(2) What is its effect on the power of man's blood to protect his organism against infection?

The first of these two questions I have tried to answer in the present lecture. The second I hope to attack later.

Before presenting the results of my own experiments I will endeavor to summarize what seems to me established as the result of work previous to my own.

We may treat as established the following statements:

I. ALCOHOL AND METABOLISM.

(1) In healthy persons alcohol is capable of replacing satisfactorily the fats and carbohydrates of ordinary food.

(2) It is not yet settled whether or not alcohol can replace the proteids of our customary diet.

(3) The food value of alcohol as a substitute for carbohydrates and fat is perfectly consistent with its toxic properties. It is beyond doubt both a food and a poison.

II. THE ACTION OF ALCOHOL ON DIGESTION AND ABSORPTION.

(4) While it is in the stomach alcohol disturbs the digestive processes to a greater or less extent according to its concentration.

After absorption (either from the stomach or from the intestines) alcohol acts upon the stomach through the nervous system, and exerts a favorable influence both on its secretions and on its motility. But the nervous system is soon blunted to its influence, so that more and more is needed to influence digestion.

(5) On the intestinal absorption of food alcohol has no considerable influence so far as is known.

III. ALCOHOL AND DIURESIS.

(6) In healthy persons and in renal or cardiac disease, alcohol has no considerable effect as a diuretic. The free diuresis often seen after beer drinking is due in part to the water ingested and in part to the CO_2 and other non-alcoholic constituents of the beer.

IV. ALCOHOL AND DIAPHORESIS.

(7) The experimental data are not conclusive, and great individual differences exist, but the majority of experiments seem to show that alcohol diminishes sweating in healthy persons.

V. ALCOHOL AND RESPIRATION.

(8) Practically all experiments show that under the influence of alcohol a larger volume of air passes through the lungs. This is especially marked in fatigued persons. There is, however, no increase in the amount of O_2 absorbed or in the amount of CO_2 given off.

The patient is made to do more work in breathing without getting any known benefit from it.

ALCOHOL AND PULSE RATE.

Lichtenfels and Frohlich[1] found first a decrease, later an increase in pulse rate.

Tscheschichin[2] and Ruge[3] noted a very marked rise in pulse.

Zimmerberg[4] could find no variation from normal. Reiss got similar results.

Mertens[5] noted no change, Martins[6] a decrease, Jacobi,[7] Duchek,[8] Hemmeter[9] no increase.

In all the experiments in which subjects have been put into an unchanging environment and conditions, the changes in pulse before and after alcohol sink to a minimum.

Wendelstedt[10] took especial pains that the persons on whom he experimented should remain quiet some time before the beginning of the test and stay in just the same position after swallowing the alcohol. With these precautions the changes in pulse rate were trifling. For a few beats the pulse rate sometimes rose a little, but soon returned to normal. Occasionally there was a slight decrease in rate. The following data may be quoted.

N. K., healthy, fasting, horizontal position for two hours before the experiment.

I.	9.30 A.M.	Pulse 54
	9.50	" 56
	10.07	Sherry, 300 c.c. (=10℥)
	10.15	Pulse 56
	10.40	" 56
	11.05	" 56
II.	Same subject; same conditions.	
	8.55 A.M.	Pulse 60
	9.15	" 60
	9.30	Brandy, 100 c.c. (3½℥)
	9.40	Pulse 57
	10.00	" 58
	10.20	" 58
	10.40	" 55
	11.00	" 60
III.	Same subject after a hard day's work, and one-half hour in horizontal position.	
	6.40 P.M.	Pulse 64
	6.55	Absolute alcohol ℥ ii diluted
	7.05	Pulse 64 (subject drunk)
	7.28	" 64
	7.55	" 68
	8.15	" 64 (less drunk)
	8.35	" 68

To the finger the pulse after alcohol feels fuller and stronger, and the sphygmograph shows a tracting like the "pulsus celer" of aortic regurgitation.

BLOOD PRESSURE AFTER ALCOHOL.

Zimmerberg[11] found after putting alcohol into a cat's stomach a marked fall in blood pressure.

Gutnikow[12] experimented on curarized dogs, into whose stomachs he introduced 250 c.c. of 50 per cent. alcohol. The result was a considerable fall in blood pressure together with a dilatation of the small arteries, capillaries, especially in the territory of the splanchnic.

The dog here used was so small (20 kilos), and the dose so enormous, that no inferences ought to be made from these experiments as to the effect of moderate doses in man.

Weissenfeld[13] reports work done in Binz's laboratory. The experiments were carried out on men with the help of v. Basch's sphygmoma-

nometer. After 2 or 3 oz. of sherry the pulse rose in three cases from 15 to 30 mm. Hg.; in one even as much as 60 m.m. Hg.

Passler [14] and Schule,[15] working with Gaertner's tonometer on a healthy man, recorded a fall from 110 to 95 mm. Hg. twenty minutes after sherry and brandy. An hour later the pressure was 115 again.

Rosenfeld [16] worked with dogs, connecting the femoral artery with a mercury manometer. He was careful to avoid the common mistakes of overdosage and overconcentration in the alcoholic solutions used, which were of 10 to 25 per cent. strength, and introduced by a tube into the dog's stomach.

The question whether dogs tolerate alcohol better than men seems to be answered in part by the following facts:

(1) It takes the same dose *per kilo* to narcotize an average man or an average dog.

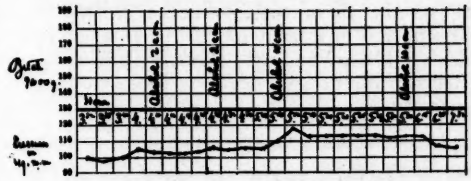

CHART I.—Blood pressures in dogs after alcohol. (Rosenfeld.)

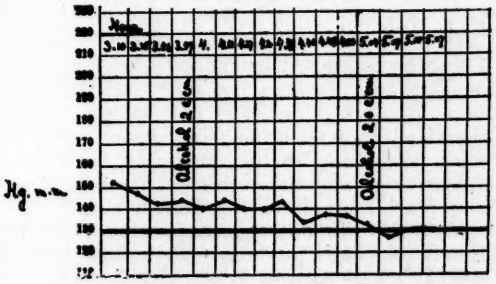

CHART II.—Blood pressures in dogs after alcohol. (Rosenfeld.)

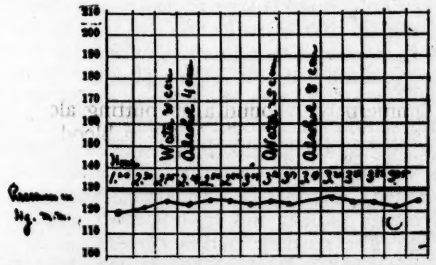

CHART III.—Blood pressure in dog after alcohol.

(2) It takes approximately the same dose *per kilo* to kill a man or a dog.

But to make sure that he did not err on the side of too small dosage Rosenfeld increased his doses from the equivalent of ℥ i of whisky at a time up to the equivalent of ℥ x of whisky.[17]

The upshot of his 300 or more measurements in 8 dogs was that alcohol has no appreciable effect upon the dog's blood pressure. He used fresh dogs with high blood pressure (152 mm. Hg.), tired dogs with low pressure (82 mm. Hg.) and dogs wiith pressures intermediate.

The result was the same in all cases. Variations in the pressure from hour to hour were no greater than occurred spontaneously, that is, when no alcohol was given.

ALCOHOL AND TEMPERATURE.

In states of profound intoxication, belonging practically to the class of collapse states, there may be a very marked lowering of temperature. Experimentally Rosenfeld produced readings of 88.7 F. in dogs.

Therapeutic doses of alcohol given to sound men seemed to produce a slight lowering, amounting, according to the experiments of Binz's pupils, to about .7° F. In sick people the decrease was about the same. The temperature of the skin is greater than that of the rectum, a fact which seems to indicate that the lowering of the rectal temperature and presumably of that of the internal organs in general is due to the dilatation of the cutaneous vessels.

Dumouly [18] found that no effect was produced in fever patients by doses of less than 20 gm. of absolute alcohol (= about ℥ iss of whisky).

ALCOHOL AND THE NEUROMUSCULAR SYSTEM.

The most recent and careful researches on this much-disputed point seem to show that in fresh healthy men the power of voluntary muscular movement is increased about 7 per cent. for the first one-half hour, after which there is decrease to a point about 5 per cent. below the normal.

By diminishing the sense of fatigue, alcohol undoubtedly enables men to push themselves for a short time beyond the limit which nature would otherwise have imposed upon them through fatigue.

ALCOHOL AND THE SUSCEPTIBILITY TO INFECTION.

Latinen found a decrease in the number of leucocytes in cases of pneumonia during alcoholic medication, and Massart and Bordet observed a negative chemotactic effect upon leucocyte even with very dilute solutions of alcohol.

That it increases in animals the susceptibility to infection and diminishes the animal's power of resistance has been shown so many times and in so many ways that it is not necessary to go over the evidence in detail.

In man something more or less akin to experimental evidence in this matter is furnished by the well-established fact that alcoholics are predisposed to infectious diseases, and have them in a very virulent form.

More direct and important evidence is furnished by researches designed to investigate the antitoxic power of the blood in health and in disease with and without alcohol.

Mircoli [19] compared the antitoxic power of normal human blood with that of alcoholics, by test-

ing the power of each to neutralize Maragliano's tuberculin. The blood of normal men was found to neutralize large doses of this toxin; for example, 10 c.c. of this tuberculin is a fatal dose for animals of 1 kilo weight. But this animal can be protected against this dose by the injection of 2 to 3 c.c. of normal human serum. The serum of chronic invalids, on the other hand, does not possess this power.

But the serum of drunkards was found to be much more more strongly antitoxic than that of normal men. In one case one-tenth of a c.c. of drunkard's serum was sufficient to protect a kilo animal against 10 c.c. of tuberculin. From these facts Mircoli concludes that alcohol is a most valuable remedy for tuberculosis, forgetting that tuberculin and tuberculosis are by no means the same, and that alcoholic cirrhosis and tuberculosis of the lungs or peritoneum are very frequently associated.

Nevertheless, Mircoli's results are of great interest both in themselves and as an indication of the direction in which future research should be turned.

More recently Abbott and Bergey[20] have undertaken a study of the blood reactions of normal and alcoholized rabbits by Ehrlich's methods. Their conclusions are: (1) The daily administration of alcohol per os to rabbits reduces the amount of hemolytic complement in their blood. (2) The diminished reactivating power of the blood of alcoholized rabbits is not due to the presence of small amounts of alcohol as such in the blood. (3) Alcohol not only reduces the amount of complement in the rabbit's blood, but may cause at the same time a reduction in the number of free specific receptors in the blood of a rabbit artificially immunized against an alien blood. (4) The diminished complement-content of the blood of alcoholized rabbits renders the animal more susceptible to the toxic action of an alien blood.

TOLERANCE OF FEBRILE PATIENTS FOR ALCOHOL.

It must have forced itself upon the notice of any one who has watched the effects of alcohol in fever cases, that such patients will stand an extraordinary amount of the drug without any signs of intoxication.

For example, I recently watched a patient with typhoid in the service of Dr. F. C. Shattuck, who took for nearly a fortnight two ounces of whisky every hour, day and night, that is, three pints of whisky every twenty-four hours, without any sign of intoxication. In the same service a young girl also suffering from typhoid took 60 ounces of champagne; nearly two quarts every day for three weeks without any of the ordinary evidences of intoxication.

This certainly proves that alcohol acts differently in disease and in health, and makes it obvious that the results of experiments with alcohol on healthy men should not be supposed to prove what its effects in sickness may be.

But because alcohol acts *differently* in disease, are we obliged to suppose that it acts *more beneficially* than in health?

That we do not smell it in the breath of typhoid fever patients, despite a dosage which would make a well person reek with it, does not point to any considerable difference in the amount burned up in the body, for even in the intoxicated states produced by alcohol in healthy persons, 98 per cent. of the alcohol is burned in the body. The alcoholic odor in the breath does not prove that any considerable portion of the alcohol is being excreted through the lungs.

Alcohol given to dogs with sugar does not make them nearly as drunk as when it is given without sugar,[21] but its harmful effects are no less marked.

That sick persons are not intoxicated even by enormous doses of alcohol gives us no evidence whatever that it is doing good, nor on the other hand is it a reason for believing that it does harm. It is an interesting but a wholly neutral fact so far as the therapeutic value of alcohol is concerned, and is important chiefly as a warning to those who tend to argue directly from the known effects of the drug in health to its supposed effects in disease.

THE PSYCHIC EFFECTS OF GIVING ALCOHOL.

(1) On the mind of the physician and of the patient's family or friends.

(2) On the mind of the patient himself.

(1) The virtues of alcohol as a stimulant have been so firmly established in the minds of the laity, that both the patient and his friends are apt to be comforted by the knowledge that it is being given. It does not sound exactly like a drug, its taste is generally not disliked, and the cheering impression that something is being done, and done pretty frequently, is diffused among those who are caring for the patient, and may reach the mind of the patient himself.

By a sort of auto-suggestion, a similar impression is sometimes produced upon the physician as well. It is very hard to sit still and do nothing for the patient, and when we have no very reasonable belief in the efficacy of a drug, it is a relief to the physician's mind to give *something*, especially something that is welcomed by the patient and his friends, and something of which the community generally has a high opinion. Then the soothing effect upon the patient, which the narcotic action of alcohol produces, is indirectly soothing to the physician as well, and increases his willingness to prescribe and to continue the so-called "stimulant." In short, alcohol makes physician, patient and friends more comfortable.

(2) The narcotic action of alcohol, its tranquilizing and benumbing effects upon the nervous system, have been very properly insisted on as a therapeutic influence of considerable importance by Cushny and by Meltzer in recent addresses on the use of alcohol in disease. To save the patient from worrying about himself, from broodings on the cause and apprehensions about the future of his disease is certainly to do him a service. But

we cannot, at the same time, praise alcohol for bringing the patient into so passive and vegetative a condition and expect also to take advantage of that active, fighting, determination to get well, which many physicians suppose to have a real effect in combating disease. Either the tranquillity or the actively resistant will-power of the patient must be sacrificed. Whether either factor has any genuine influence on the course and outcome of disease is entirely a matter of guess work. We have no definite knowledge in the matter, and all that I mean here to point out is, that if we are to maintain that the narcotic effect of alcohol is beneficial, we must give up the idea that the patient's will-power is an important factor in his recovery.

But although it is generally assumed that alcohol has a benumbing effect, and so a tranquilizing effect upon the patient, it has not been my experience that any such effect is always or even usually to be observed. That very striking *neutrality* of alcohol, which has been my chief lesson throughout all the other observations which I have made on its action, has impressed me and surprised me afresh in studying its psychic effect. Only in four out of the 69 cases in which I have watched for the tranquilizing effect of alcohol has any such effect been noticeable. In the vast majority of patients as I talked with them several times each day during a period of about six weeks, no change whatever in the prevailing mood could be determined. The down-hearted patients were not notably more or less down-hearted, the cheerful ones were neither more nor less cheerful. One patient in especial, in whom the dose of 60 ounces of champagne per twenty-four hours, was suddenly cut off, showed not the slightest psychical change that I could detect.

A few of the typhoid patients seemed to sleep a larger part of the day during the time when alcohol was given them, but it was difficult to be sure that this change would not have taken place spontaneously. In one patient who became more sleepy just after the alcohol was given him, the sleepiness continued just the same for the next ten days after the alcohol was withdrawn, in fact until the temperature became normal.

Very likely finer psychical tests, such as Kraepelin employed in his studies on typesetters, would have shown that, in disease as in health, the associations and reactions necessary for the more delicate psycho-motor processes are slowed by the action of the drug; but that any constant effect was produced on the temper, mood and spirits of the patient I could see no reason to believe.

MEASUREMENTS OF BLOOD PRESSURE.

From this résumé will be seen that no considerable amount of work on the estimation of blood pressure in human beings during the administration of alcohol has so far been done. Rosenfeld's observations are, it seems to me, conclusive, so far as concerns the effect of the drug upon dogs, but we cannot immediately reason from its effect in healthy or in tired dogs to its effect in sick men. Accordingly, I have undertaken a series of measurements of the blood pressure before, during and after the administration of alcohol in patients for the most part sick with typhoid fever in the medical wards of the Massachusetts General Hospital. I am especially indebted for the opportunity to carry out these researches to the kindness of Drs. F. C. Shattuck and R. H. Fitz. My method of work has been the following:

Two instruments have been used: the Riva-Rocci machine for the estimation of the maximum or systolic pressure, and Oliver's hemodynamometer for the estimation of minimum or diastolic pressure. The working of these instruments may be explained in a few words.

The Riva-Rocci apparatus consists of a dilatable rubber armlet about three inches wide, covered with tough canvas as a support to the rubber, and arranged by means of a series of hooks and eyes so that it can be tightly fitted to arms of any size. By means of a V-tube air is blown simultaneously into this armlet and into the bulb of a mercury manometer. For inflation an ordinary cautery bulb was used.

To use the instrument we attach the armlet snugly around the patient's upper arm about two inches above the bend of the elbow, and force air into it until the radial pulse disappears. When the radial pulse is no longer felt, we note the point to which the mercury column has been forced up and record the reading in millimeters. The instrument appears to be very accurate in the sense that different observers after an equal amount of practice read practically the same independently, and that successive readings by the same observer in the same patient do not vary more than 3 or 4 mm. of mercury. It is very easy to use, and requires very little practice. It is not at all painful to the patient, as I have ascertained by many experiments upon my own arm, and no patient has complained of it in any way, although in some cases more than a dozen readings were taken in the course of a day. No bad effects upon the arm of the patient have occurred, although the cases selected were mostly typhoid, in which the thrombosis is well known to be favored. Any errors that there may be in the instrument may be disregarded in a series of comparative observations upon the same patient by the same observer, since the amount of error is presumably the same in all the measurements.

Oliver's hemodynamometer is a more difficult instrument to use. It consists essentially of a hollow rubber pad filled with glycerine and water which is put over the radial artery and through which the pulsations of the artery are transmitted to a rigid rod and thence through a ratchet and pinion adjustment to a needle moving upon a clock-face dial. By exerting pressure with the instrument through the pad upon the radial artery the needle is made to revolve and, by suitable pressure, the pulse may be obliterated. If, then, we relax the pressure upon the artery until a faint pulsation is permitted, this pulsation is represented by slight oscillations of the needle. As

we relax the pressure gradually more and more, the needle upon the face of the dial has a double motion. It moves backward toward the starting point (zero) and it also oscillates back and forth during its course. These oscillations gradually increase up to a maximum as we relax the pressure, after which if we relax it still more, the oscillations begin to diminish and gradually disappear as the needle approaches the zero of the scale. The maximum oscillations in normal persons occur between the points marked 100 and 130 on the scale. But the pressure within the fluid pad of the instrument is the same as that within the artery when its maximum oscillation is reached, and this corresponds, as Howell has shown, to the minimum or diastolic pressure. The fluid pad obviates the difficulties of applying the instrument over the uneven surface of the wrist. The soft and elastic surface of the pad adjusts itself among the structures of the wrist, and gets into contact with the artery at some point, provided the artery is palpable at all. The chief difficulties in using the instrument are (1) to hold it steady without increasing or decreasing the amount of pressure used upon the artery, and (2) to record accurately the position of the swiftly-moving needle. With well sustained pulses it is very easy to see just where the needle starts and where it ends in each of its excursions, but in the bounding pulses of febrile patients this is often very difficult. With a moderate amount of practice, however, different observers do not vary more than five points in the scale in their readings. My instrument reads about twenty-five Hg. too high. Accordingly I subtract twenty-five from each of its readings. This prevents their possessing absolute values, but leaves unchanged the *variations* from hour to hour, which is all that I attempt here to record (see charts).

With these two instruments we have made 1,169 measurements in 58 individuals. We began by taking observations every half hour to determine the amount of range of variation at short intervals. Later we took the measurements every hour and every two hours and finally every four hours as the variations in the smaller periods of time were insignificant, or were excited from moment to moment by occurrences, the mark of which would be as likely to escape detection in half hourly as in four hourly measurements. Thus a cry or groan from another patient in the ward, the approach of dinner or the answering of a question needing some thought would send the blood pressure up a number of points, the rise lasting only a few minutes.

We began our four hourly measurements on febrile patients recumbent in bed and upon unvarying diet. After two or three records with each instrument the patient was given either half an ounce of whisky or an equivalent amount of absolute alcohol properly diluted and flavored. This dose was repeated every four hours for the first twenty-four hours and then doubled and continued for twenty-four hours more. After that it was, in the majority of cases, omitted, although in a few it was continued several days more in order to ascertain whether any further effect was produced after the first forty-eight hours. After stopping the alcohol we continued our readings for at least twenty-four hours and often longer.

Among the cases studied were 25 of typhoid fever, 2 of pneumonia, 2 of chronic valvular heart disease, 2 of malignant endocarditis, 2 of gonorrheal arthritis and 1 each of the following: pleuritic effusion, Addison's disease, cirrhosis of the liver, thrombosis of a leg vein, tuberculosis peritonitis, myelitis and phthisis.

Summing up in a few words the total result of these many measurements: They indicate that in cases of the type studied, alcohol has no considerable effect either upon the heart's action or upon the tension of the peripheral vessels that can be measured by the instrument employed. I must confess that this result was a great surprise to me. Some effect, either for good or evil, some cardiac stimulation or some vascular relaxation I had certainly expected to see, but the result, like all those obtained in my investigations of the effects of alcohol on other functions of the body, was practically *nil.*

The following charts and tables give further details of the work:

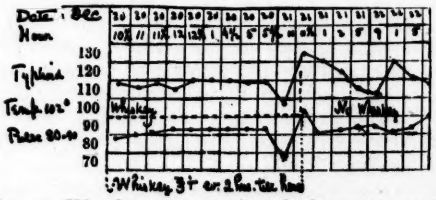

CHART IV.—Shows records of frequent pressure measurements in a case of typhoid with and without whisky.

SUMMARY AND CONCLUSIONS.

(1) In 41 patients, mostly cases of typhoid fever, 1,105 measurements of the blood pressure were made before, during and after the administration of alcohol in therapeutic doses. Neither the maximum nor the minimum blood pressure showed any variations that could reasonably be referred to the action of the alcohol. So far as was determined by the methods and in the cases used in this research, the action of alcohol upon the circulation was *nil.*

(2) The same neutrality and apparent inertness of therapeutic doses of alcohol in relation to the temperature, pulse rate, respiration rate, appetite, sleep, delirium and secretions (renal and cutaneous) of 309 patients suffering from a great variety of diseases was the total impression derived from 2,160 observations in these cases.

(3) These observations are not interpreted as proving that alcohol is useless or useful in disease.

As a narcotic and vasodilator it may have an important place in therapeutics.

(4) More important probably than any of the questions investigated so far is the problem of the effect of alcohol upon the power of the sick man's blood to protect him against infection and other harmful influences. The studies of Abbott and of Mircoli have begun to clear a path in this direction, and we have a certain amount of evidence relative to a similar problem in the lower animals. But as the results of studies regarding the action of alcohol upon animals or upon healthy men cannot be used as evidence of its action in sick men, there is a good field for experimental work in this direction along the lines of Ehrlich's newer methods.

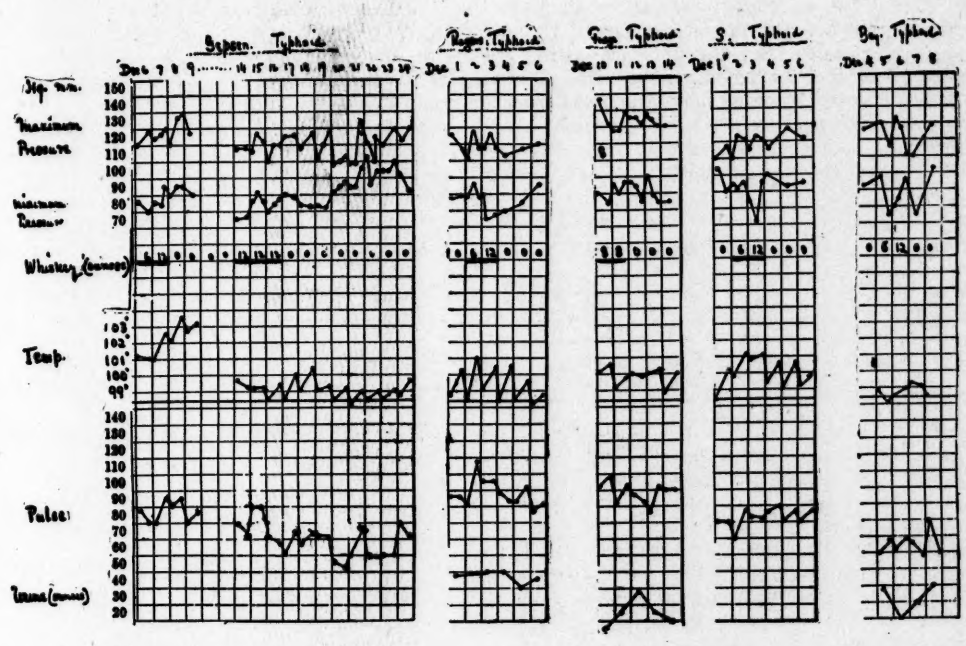

CHART V.—Variations in blood pressure measured every four or eight hours in cases of typhoid, before, during and after whisky.

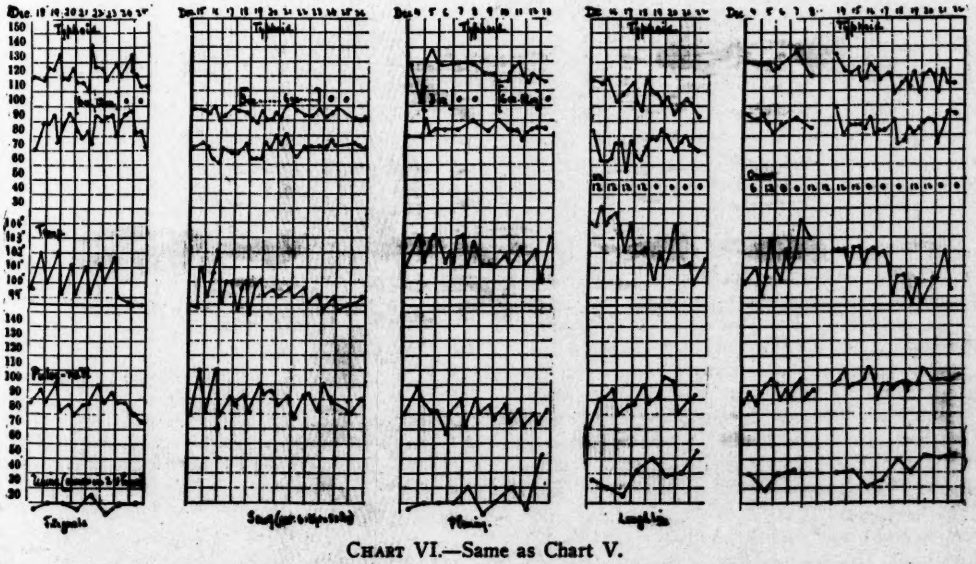

CHART VI.—Same as Chart V.

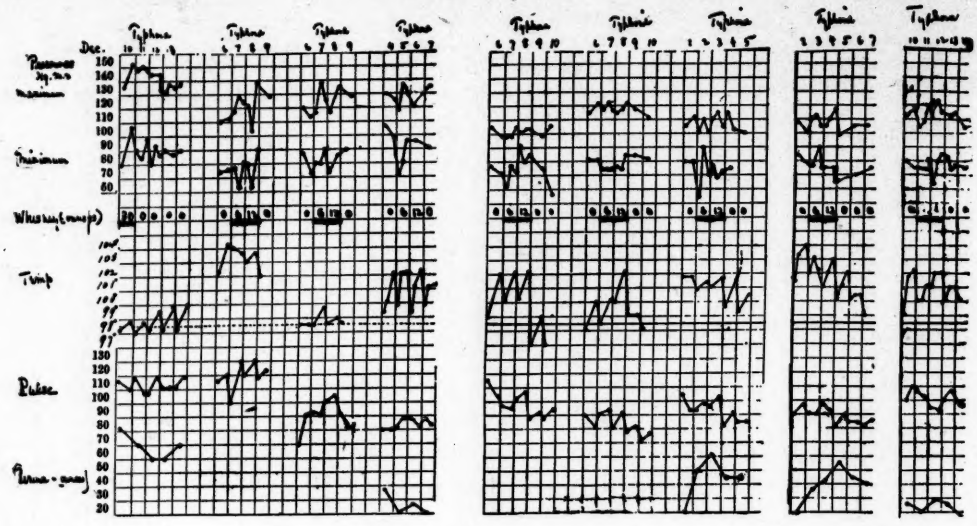

CHART VII.—Same as Charts V and VI.

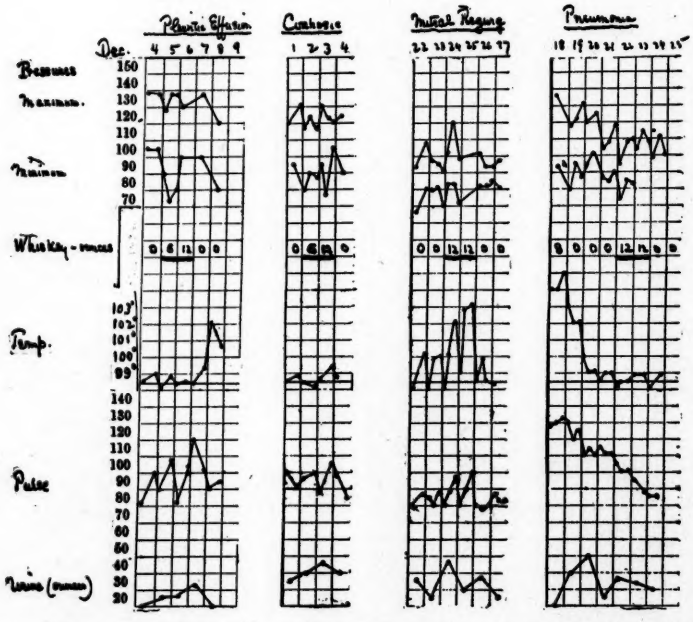

CHART VIII.—Blood pressure in various diseases before, during and after whisky.

Temperature.

Raised over .2°,	alcohol, 149 cases,	Total 161 cases.	
" " "	whisky, 12 "		
Lowered over .2°,	alcohol, 64 "	" 77 "	
" " "	whisky, 13 "		
Within .2° the same,	alcohol, 70 "	" 71 "	
" " " "	whisky, 1 "		
		309 "	

Effect of Alcohol on the Temperature in Febrile Cases (100° or more).

Raised over .2,	alcohol, 29 cases,	= 35 cases.
" " "	whisky, 6 "	
Lowered over .2,	alcohol, 20 cases,	= 28 "
" " "	whisky, 8 "	
Within .2 the same,	alcohol, 4 cases,	= 4 "
" " " "	whisky, 0 "	
		67 "

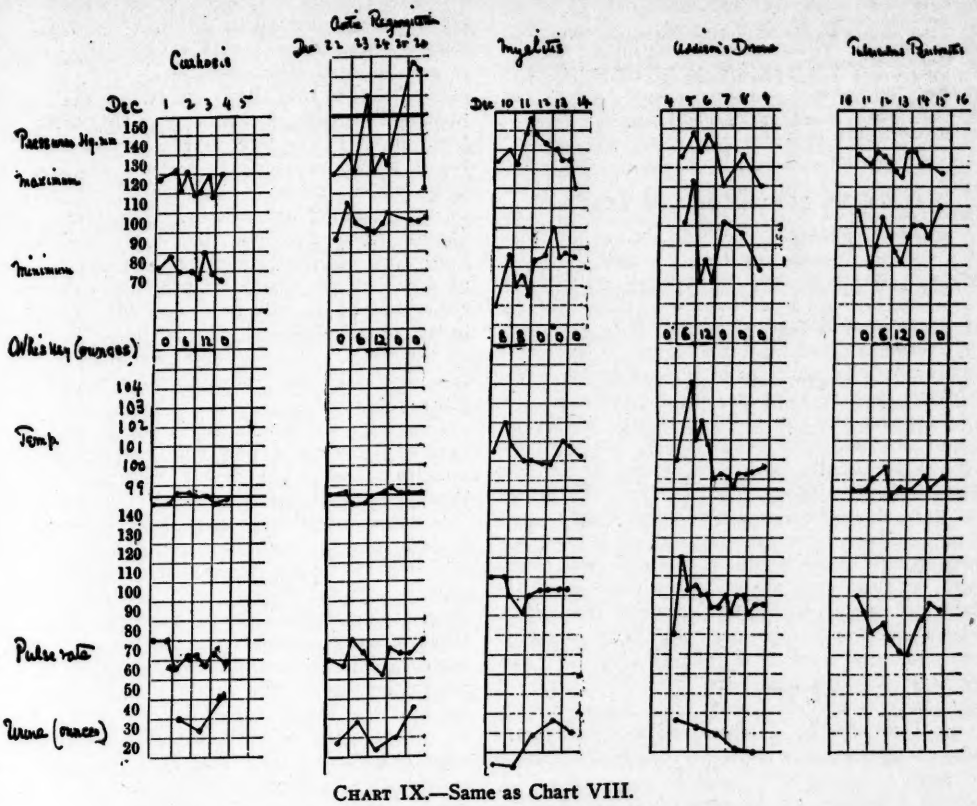

CHART IX.—Same as Chart VIII.

Pulse.

Raised over 5 beats, alcohol, 98 cases } = 106 cases.
" " " " whisky, 8 " }
Lowered over 5 beats, alcohol, 56 cases, } = 63 "
" " " " whisky, 7 " }
Within 5 beats the same:
Alcohol, 128 cases, } = 140 "
Whisky, 12 " }
309 "

Respiration.

Raised over 4 periods, alcohol, 22 cases, } = 24 "
" " " " whisky, 2 " }
Lowered over 4 periods, alcohol, 27 cases, } = 30 "
" " " " whisky, 3 " }
Rate the same, alcohol, 232 cases } = 255 "
" " " whisky, 23 " }
309 "

Food.

Taken the same.....212 cases.
" better ..... 64 "
" less well ..... 18 "
294 "

Tongue.

The same .....213 cases.
Better ..... 42 "
Worse ..... 20 "
Moister and more coated..... 6 "
281 "

Skin.

The same .....215 cases.
Moister ..... 39 "
Drier ..... 12 "
266 "

Insomnia.

The same .....155 cases.
Better ..... 7 "
Worse ..... 8 "
170 "

Delirium.

The same .....150 cases.
Worse ..... 3 "
Excited and nervous..... 1 "
Better ..... 1 "
155 "

Total number of observations.....2,160 "

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MALIGNANT TUMORS OF THE TESTIS.

BY WILLIAM B. COLEY, M.D.,

OF NEW YORK;

SURGEON TO THE GENERAL MEMORIAL HOSPITAL; ASSOCIATE SURGEON TO THE HOSPITAL FOR RUPTURED AND CRIPPLED.

MALIGNANT disease of the testis is far more likely to be sarcoma than carcinoma. I have personally observed 18 cases of tumors of the testis, of which 17 were sarcoma, and 1 teratoma.

As regards the age of the patients, while malignant disease of the testis is very rare in children, it frequently occurs in young adult life, contrary to the opinion of Butlin, who states that it rarely occurs in adults under thirty years of age. More than one-half of my own cases were young men between twenty and thirty years of age; two of my cases were nineteen years of age, none being younger than that. Nine were between twenty and thirty years of age; five were between thirty and forty years of age; one was between forty and fifty years of age; one was fifty-five years old. These figures do not bear out the statement of some, that sarcoma of the testis is a disease of childhood and old age.

With reference to the etiology, trauma plays a very important part. In 50 per cent. of my own cases there was a distinct history of antecedent injury. In most of these cases the tumor developed so quickly after the injury that there could be no question as to the latter's etiological significance. While at the present day some of the best pathologists refuse to believe that injury has anything to do with the development of malignant disease, the clinical evidence in support of the view that it is of great etiological importance, is very strong.

Antecedent injury in carcinoma of the breast is variously estimated at from 12 to 50 per cent.

Taking sarcomatous tumors as a class, there is a distinct history of antecedent injury in fully one-third of the cases, while in sarcoma of certain localities this percentage is much higher. In sarcoma of the breast every case that I have observed had a local injury prior to the development of the tumor. In sarcoma of the testis there was a local injury to the testis a short time before the tumor was noticed, in nearly one-half of the cases. The very complete statistics of Kober (*Am. Jour. of Med. Sciences*, 1899, Vol. 117, p. 35) giving a carefully tabulated series of 105 cases of sarcoma, collected from literature, shows a history of antecedent injury in 43 per cent. of the cases.

Of 51 malignant tumors of the testis collected by Curling, 6 occurred in patients below the age of twenty years; 5 were under fifteen years. Of 41 cases collected by Butlin, 5 occurred during the first fifteen years of life, the youngest in a child aged eight months.

He believes that there are two periods of life in which the disease occurs more frequently, first, from birth to the age of ten years; second, in the decade from thirty to forty. The great majority of the cases of sarcoma of the testis are of the round-celled variety. The few cases of spindle-celled sarcoma that were collected by Butlin all occurred in patients under ten years of age. While glandular infection as a rule is either absent or only occurs in the latest stages in sarcoma in general, this is not so in sarcoma of the testis. Here we find that involvement of the inguinal and retroperitoneal glands takes place very early.

Diagnosis.—The diagnosis of malignant disease of the testis is, as a rule, not difficult. The condition that most closely simulates it is tuberculosis of the testis, but only very rarely does this cause much difficulty. I have recently operated upon a case of tuberculosis of the testis, which very closely resembled sarcoma both as regards clinical history and physical characteristics. The disease was of short duration; there was a history of antecedent injury, smooth symmetrical enlargement, no involvement of the skin, no thickening of the cord; a small amount of fluid in the tunica vaginalis; no family history of tuberculosis, no evidence of tuberculous disease elsewhere. The diagnosis of tuberculosis rather than sarcoma in this case was made almost entirely upon the varying consistence of the tumor itself. In sarcoma the tumor, as a rule, is of uniform consistence, while in tuberculosis the consistence varies greatly, the epididymis being harder than the testis proper. Of course, in the later stages of tuberculosis the enlargement of the cord, early adhesion and ulceration of the skin render the diagnosis perfectly easy. The fact that in tuberculosis the epididymis is nearly always primarily involved, is also an important aid in establishing the diagnosis.

In teratoma, of course, the tumor, being made up of different kinds of tissue, necessarily varies much in consistence, but the larger size and involvement of the entire testis, makes it easy to differentiate it from tuberculosis of the testis.

Prognosis.—A careful study of all the recorded cases of sarcoma of the testis, does not permit me to agree with the statement of Kober that "The results of operative interference are very gratifying."

While in my own experience I have never seen a patient cured, it is but fair to state that the complete statistics of Kober show 9 patients that lived and were free from recurrence from 3 to 15 years. His own tables give 11 cases, but a more careful study of the tables shows that in 2 cases there was an error and instead of 9 years, they had remained well less than one year. The 9 cases cured out of 105, gives a percentage of

8.5, lower than perhaps any other variety of sarcoma, except periosteal sarcoma of the femur, which shows less than two per cent. of cures from hip-joint or high amputation.

The duration of the disease is rather shorter than in sarcoma of other localities. Kober's statistics show that in 99 cases the duration was from a few weeks to six months in 28 cases, and in 47 cases it was less than a year, and in 71 cases less than two years. In a few cases the tumor had existed a long period before operation, in 10 cases varying from six to twenty-six years. The rapid course of the disease after castration is illustrated by Kober's tables. Of 114 cases operated upon, 37 were not traced. Of the remaining 77, 41 died in from a few days to three years. Of these 41 fatal cases, 23, or 56 per cent. died within five months, of metastases; 11 others died from seven to twelve months after operation, making 83 per cent. of the fatal cases that died within the first twelve months after operation. Two patients lived beyond three years, but died later of recurrence.

While personally I have not seen a single case of sarcoma of the testis cured, it is but fair to state that in only a small proportion—about one-fourth—did I see the cases at an early stage, the remainder having been treated for recurrences at varying periods after castration. Hence, my own statistics are of little value in forming an estimate of the prognosis of primary sarcoma of the testis.

Treatment.—I believe that operation consisting of complete removal of the testis and cord as high up as the internal ring, as soon as the diagnosis is made, is the only proper and rational treatment.

In addition to this I would strongly advise a course of treatment with the mixed toxins of erysipelas and *Bacillus prodigiosus,* for two or three months after operation as a prophylactic measure. I have thus far had the opportunity of using the toxins only in advanced recurrent round-celled sarcoma of the testis, with large retroperitoneal tumors. In some of these cases there has been marked improvement and retardation of the growth for a considerable period, but no permanent cure has resulted. In one case the patient had a long course of X-ray treatment, lasting for months, without any appreciable effect in checking the disease.

The only hope of better results lies in earlier diagnosis, and the practice of delaying for weeks while trying the effect of mercurial ointment, so universally advocated by text-books and surgeons, is, I believe, to be strongly condemned. In the great majority of cases the diagnosis can be made in the early stages if a careful examination is made. In cases of doubt, the dangers of delay are so great that immediate exploratory operation is demanded, with castration, if section of the tumor confirms the suspicions of sarcoma. One should never remove a section and wait for a microscopical diagnosis, since the danger of infected cells being carried to remote parts by the blood current, is, I believe, a real one.

The prognosis of teratoma is very good, yet, though pathologists are inclined to classify this variety as a benign growth, not infrequently recurrence and metastases do occur. My own case is still well over two years after operation.

The following are reports of cases:

Round-Celled Sarcoma of the Testis Recurrent in the Abdomen. Case I.—R. C., thirty-three years of age; F. H. good; no history of trauma. The patient first noticed pain in the left testis in January, 1893; the left testis also appeared slightly larger than the right and increased rather rapidly in size. Two months later castration was performed by Dr. A. T. Cabot of Boston, after which the patient remained well for over two years. In July, 1895, he began to have pain in the loins and at about the same time he noticed a swelling in the abdomen.

The patient first came under my observation Nov. 25, 1895, at which time there was a large mass extending from the free border of the ribs down to two inches below the umbilicus filling up nearly the whole left side of the abdomen. The mass was hard, deeply fixed, probably originating in the retro-peritoneal glands. The erysipelas toxins were tried for two weeks without any apparent effect.

Recurrent Round-Celled Sarcoma of the Testis and Abdomen. Case II.—C. B., aged nineteen years, first noticed a swelling of the left testicle in January, 1895. The history contains no reference to trauma. The tumor slowly increased in size, without pain, until one year later it had reached the size of two fists. It then became slightly painful and the patient began to complain of numbness of the leg. Examination at this time by Dr. McBurney showed the entire pelvis and abdominal cavity extending as far as the umbilicus, filled with a hard, firmly fixed mass, partly solid and partly semifluctuating. The testicle was removed by Dr. McBurney. An incision was made into the iliac region allowing the escape of five to six ounces of serosanguinolent fluid. The tumor proved to be a typical round-celled sarcoma. The patient's general condition was so bad that no further treatment was advised.

Round-Celled Sarcoma of the Testis of Traumatic Origin. Case III.—E. F. K., aged twenty-two years, F. H., good. While attempting to learn to ride a bicycle in the spring of 1896, he fell and injured the left testis. A few weeks afterward he noticed an increase in the size of the injured testicle, but there was no pain until the growth had reached considerable size. In August, 1896, it had become about as large as a closed fist, was slightly painful but not tender. Castration was performed by a Philadelphia surgeon. There were no enlarged glands in the groin. In May, 1897, about eight months after the operation a return of the disease was noticed in the wall of the scrotum and at the lower end of the cord. A second operation was performed

June 24, 1897, the glands in the groin and the redundant portion of the scrotum being removed. Within two weeks after the operation the patient developed severe neuralgic pain in the lumbar region and down the left leg; the pain increased in severity and during the month's hospital treatment he lost 40 pounds in weight. At this time he began to have increasing gastro-intestinal disturbances, severe abdominal pain, nausea and vomiting. Physical examination at that time showed in the iliac fossa a hard, firmly fixed mass, extending nearly to the diaphragm and in the central portion projecting forward to the anterior abdominal wall. The patient died one month later. A very complete autopsy was obtained in this case, the examination showing that nearly every organ in the abdomen and thorax was involved with typical round-celled sarcoma. The entire duration of the disease in this case was one and a half years, or one year after the first operation.

Recurrent Round-Celled Sarcoma of the Testis. Case IV.—C. M., twenty-eight years of age, F. H., good. The patient first consulted me on April 26, 1899, having been referred to me by Mr. Watson Cheyne, of London. He gave a history of having fallen from a bicycle three years before, bruising his knee and right groin, causing a swelling of the glands sufficient to keep him in bed for a few days. About two years ago, or one year after the injury, he first noticed a swelling of the right testis. This increased slowly in size without being painful. December, 1898, it measured 12 inches in circumference, was smooth, symmetrical and was at first supposed to be hydrocele and tapped without result. Dec. 10. 1898, castration was performed by Dr. Alfred Fripp, of London. The patient made a good recovery and was well until four months later, when he noticed discomfort in the abdomen, probably originating in the mesenteric glands. The patient came under my care in the latter part of April, 1899, and was treated with the mixed toxins of erysipelas and *Bacillus prodigiosus* from May 1 to October 1. At first there was a decided decrease in the size of the abdominal tumor and improvement in symptoms and general health. The patient was able to go about and a great part of the time during the summer played golf. In October he noticed some loss of weight and the tumor began to increase perceptibly. His condition grew worse rather rapidly from this time on, and three months later he developed a recurrent growth in the spine, causing great pain and, finally, paralysis. He died in the spring of 1900. The entire duration of the disease in this case was three years, or about one and a half years after castration.

Round-Celled Sarcoma of the Testis, Traumatic. Case V.—F. H., aged twenty-seven years, farmer by occupation, consulted me July 1, 1898. There was no history of malignant or tuberculous disease in the family. The patient had been well until two years ago, when he was kicked by a horse in the right testicle. A small lump appeared immediately after the injury and, although it never disappeared entirely, it did not increase in size, until about four months before my first observation, when the patient fell through a hay rack, again injuring himself in the same region. Immediately thereafter the old swelling of the testis began to increase rapidly in size. Physical examination made August 8, 1898, showed the right testicle the size of a cocoanut; a portion of the tumor was solid, the remaining part showed distinct fluctuation, simulating fluid in the tunica vaginalis in addition to a solid tumor of the testis. His general health was perfect, the cord was not enlarged and the patient never had any pain. The diagnosis of sarcoma was made and, in view of the history and physical characteristics, castration was advised. I made the incision over the inguinal canal, as in Bassini's operation for inguinal hernia and the entire testis tunica vaginalis and four inches of the cord were removed en masse. The tunica vaginalis contained from four to five ounces of straw-colored fluid. The solid tumor of the testis weighed 12 ounces and 17 grains. The wound healed by primary union. Microscopical examination showed the growth to be a typical round-celled sarcoma. The patient left the hospital in ten days. A recurrence, however, took place in the abdomen and the patient died within one year of the operation. The duration of the disease in this case dating from the time when the small lump in the testis began to enlarge was scarcely more than a year.

Round-Celled Sarcoma of the Testis—Trauma. Case VI.—M.M., single, twenty-eight years of age, driver by occupation, first consulted me Feb. 10, 1900, with the following history: No malignant or tuberculous disease in the family; nine years ago had an attack of gonorrhea. Four weeks before calling on me the patient fell astride a bar, injuring his right testis. A swelling appeared at once and did not disappear. Two weeks later the patient noticed that the swelling was increasing in size. There was no pain at first, but later a slight dragging pain on account of the weight of the swelling set in. Two weeks before I saw the patient he visited the out-patient department of Bellevue and was tapped for supposed hydrocele. Nothing but blood, however, was found. A second tapping was done with the same result. Physical examination at the time I saw the patient, at the Hospital for Ruptured and Crippled, showed a tumor of the right scrotum, the size of an orange, symmetrical in shape and semifluctuating; the skin was freely movable. There was little or no tenderness on pressure. In view of the very rapid development of the tumor, following a rather severe injury, the diagnosis of hematocele with possibility of sarcoma, was made and immediate operation advised. Two days later I operated at the General Memorial Hospital. On opening the tunica vaginalis, about four ounces of dark, grumous blood escaped. The testis was found enlarged to

about three times its normal size and was so soft that it closely simulated fluctuation. Being convinced that it was malignant, I continued the incision up into the inguinal canal and removed the entire testis and cord very high up. The specimen was carefully examined by the pathologist of the hospital and pronounced at first non-malignant. I was so sure, however, from the clinical history and the gross appearance that we had to deal with a sarcoma of the testis, that I insisted on a more careful examination and after numerous sections, the pathologist found an area showing the typical structure of a round-celled sarcoma. At this time there was no evidence of any trouble in the abdomen. The subsequent course of this case is of very great interest.

Within two weeks after leaving the hospital, he was admitted to the service of Dr. B. F. Curtis of the Bellevue Hospital with a large abdominal tumor. March 16th, or less than five weeks from the date of my own primary operation, Dr. Curtis made an exploratory incision and found a large tumor involving the right kidney and probably retroperitoneal glands, the size of a man's head, of soft consistence and surrounded by a thin capsule, closely adherent to the large intestine and stomach, having apparently developed between the layers of the mesentery. Dr. Curtis states that there was almost no glandular involvement and the portion of the tumor, removed for microscopical examination, was pronounced round-celled sarcoma. The patient died on the 18th of April of progressive cachexia and persistent vomiting from pressure on the duodenum.

This case is most remarkable in that the whole course of the disease, from the date of injury, January 10, to the date of death, April 18, was scarcely more than three months. It also furnishes a most convincing example of acute traumatic malignancy, the causal relation between the injury and the development of the sarcoma being beyond question.

Recurrent Sarcoma of the Testis. Case VII.—W. T., aged thirty-two years; born in the U. S., no trauma, was seen in consultation with Dr. Dowd, January, 1900. The patient first noticed a small lump at the bottom of the right testis in June, 1899. This grew rapidly, but was never painful. Nov. 15, 1899, the testis was removed by Dr. L. Boulton Bangs. The tumor measured nine inches in circumference. The patient complained of severe pain in the back before operation, exactly the same as at the time of his admission to the General Memorial Hospital, although no enlargement of abdomen was noticed at that time. A curious phenomenon as regards the periodicity of the pain was observed in this case. Very severe pain developed in the groin and back every Tuesday and Friday at 3 P.M. Shortly after the operation a tumor was discovered in the abdomen and January, 1900, several masses could be felt in the abdominal cavity, apparently the retroperitoneal glands. There was also local recurrence in the cord and the patient died a few months later. The whole course of the disease in this case was a little more than a year, and less than six months after operation.

Recurrent Round-Celled Sarcoma of the Testis, no Trauma. Case VIII.—L. K., twenty-eight years old, born in Russia; occupation, shop work. The patient consulted me March 29, 1901, having been referred to me by Dr. W. B. De Garmo. Two years prior to this, he first noticed a painless enlargement of the right testis. The first operation was done on Dec. 8, 1899, by Dr. De Garmo at the Post-Graduate Hospital. A recurrence was noticed in the glands of the groin in September, 1900, about ten months after the operation. In December, two months later, he began to have severe lumbar pain and there was rapid decrease in weight. On March 29, 1901, when he consulted me, there was a large recurrent mass in the abdominal cavity in the retroperitoneal region. The patient was greatly emaciated and his condition was considered hopeless. Of the exact duration of his life, after this, I am not aware.

Round-Celled Sarcoma of the Testis, Recurrent. Case IX.—P. H., thirty-eight years of age; mining engineer by occupation. F. H., maternal grandmother died of cancer of the breast. P. H., the patient, has always been a great horseback rider. Four years ago he first noticed a small painless enlargement of the left testicle. As the tumor enlarged in size, he had some discomfort and dragging sensations in the cord. Operation one year after discovery of the trouble. The patient remained free from a return for two years and at this time he passed a satisfactory examination by the Equitable Life Insurance Co. Shortly after that he began to have pain in the back and was treated for lumbago. Instead of losing flesh his weight, which normally was 137 pounds, had increased to 145, at the time of my first examination, July 16, 1900. This increase was largely due to the great edema of the leg and thigh. At this time he had a great deal of pain which was worse at night. His left leg began to swell Jan. 1, 1900. Physical examination July 16, 1900, showed the left leg and thigh very greatly swollen and a hard mass in the left iliac region. The patient's general condition was fairly good, although he was slightly emaciated. He was treated for several months with the mixed toxins of erysipelas and *Bacillus prodigiosus*, and although there was marked temporary improvement, after a while the toxins seemed to have lost their effect and the disease progressed, causing death about six months later.

This case is distinct from the fact that the patient remained in perfect health for more than two years after operation and then had a recurrence which proved fatal.

Round-Celled Sarcoma of the Testis. Case X.—T. B., thirty-two years old; Italian, consulted me April 1, 1902. He stated that he had had a small tumor of the testis for twenty-two years; there was, however, no increase in size until eight months ago when it began slowly and

steadily to increase in size. There was no pain. At the time of my observation the tumor was of about the size of an orange, symmetrical in outline, skin normal, consistence slightly varying, testis and epididymis both involved; cord not enlarged. Operation April 2, 1902, at the General Memorial Hospital. Testis and cord were removed through Bassini's incision for hernia; there was no fluid in the tunica vaginalis in this case. Subsequent history is not known.

Sarcoma of the Left Testis. Case XI.—R.M., aged twenty-seven years, F. H., good. P. H. Fourteen years ago, while playing ball, the patient was struck in the left testis. A small lump was noticed which never entirely disappeared, but did not increase in size until six years ago. Castration was performed Oct. 3, 1900, by Dr. James Peterson. A second operation was performed shortly afterward for local recurrence. The patient was referred to me by Dr. Peterson, and physical examination April 23, 1900, showed a large recurrent mass in the abdominal cavity. No further treatment was advised as the patient was greatly emaciated and the mass in the abdomen was so large that it was not thought advisable to try the toxin treatment. The subsequent history of the case I have been unable to trace.

Sarcoma of the Testis—Trauma. Case XII.—C. G., forty-two years of age. F. H. good; brother died of phthisis. P. H. Eight months ago the patient injured the right testis while lifting, but there was no increase in size. Five months ago he again struck the same testis against a work-bench. Swelling developed immediately and slowly increased in size, causing no pain, except a dull dragging sensation. Physical examination, Oct. 25, 1901, shows the right testis as large as an orange. The whole testis seems transformed into a symmetrical tumor of solid consistence. There is a slight amount of effusion in the tunica vaginalis, no enlargement of the cord, no adhesion to the skin nor any of the characteristics of tuberculous disease. Clinical diagnosis: Sarcoma. Patient refused operation, hence there is no microscopical confirmation of the diagnosis.

Recurrent Sarcoma of Testicle. Case XIII.—A. W., fifty-five years old; F. H. good; occupation, painter; no history of trauma; does not ride bicycle. He first noticed a painless swelling in the right testis in July, 1900; this slowly increased in size but never became painful. July 24, 1902, the patient was operated upon at the German Hospital, by Dr. Willy Meyer, the left testicle being removed. A recurrent growth soon appeared on the right side, just above the testis. This was removed October 7 and microscopical examination made at the German Hospital showed the growth to be large round-celled sarcoma. Rapid recurrence followed the second operation, recurrence taking place in the pubic and inguinal regions, also at the base of the scrotum. The patient was referred to me by Dr. Willy Meyer, Nov. 24, 1902. Physical examination at that time showed an ulcerating mass in the left groin extending to the base of the scrotum involving the entire pubic region; retroperitoneal glands not markedly involved. General condition of the patient fair; has apparently lost little weight. There is considerable discharge from the growth of extremely foul odor. The patient entered the General Memorial Hospital November 25 and received X-ray and toxin treatment for about two months. The foul odor, which was very pronounced at the time of his admission, nearly disappeared under the treatment and there was a slight decrease in the size of the tumor. The patient was discharged owing to insubordination at the end of this time.

Recurrent Round-Celled Melanotic Sarcoma of Left Testis, Traumatic. Case XIV.—G. S., twenty-nine years of age; perfectly well until he fell from a bicycle in August, 1896, injuring the left testicle. A tumor appeared in the early part of September, within two to three weeks of the injury. This increased rapidly in size. The first operation was performed in January, 1897, by Dr. Millbank of Albany. Recurrence quickly followed in the cord and inguinal glands. Four operations were performed, the last two by myself. The erysipelas toxins were then used for two to three weeks, without effect. The tumors quickly recurred and systemic infection soon followed causing death in January, 1898. The entire duration in this case was fifteen months.

Teratoma of the Testis. Case XV.—Mr. J., twenty-seven years of age, German, always in perfect health; no trauma. In April, 1900, he first noticed a slight enlargement of the testicle. This increased uniformly, without pain, until the time of my first observation, Dec. 10, 1900. Physical examination then showed a tumor about the size of an orange, symmetrical in shape, very firm in consistence, giving all the characteristics of a sarcoma of the testis, which was the clinical diagnosis made. The glands of the groin were not enlarged and general health was perfect. Operation Dec. 12, 1900, consisting in removal of the testis and the cord as high up as the internal ring. The wound healed without suppuration. Feb. 18, 1903, the patient was exhibited before the Genito-Urinary Section of the Academy of Medicine, in perfect health.

ALCOHOLISM IN WOMEN.*

BY AGNES SPARKS, M.D.,
OF BROOKLYN, N. Y.;
PRIVATE SANITARIUM FOR INEBRIATES.

IN my paper "Alcoholism in Women, Its Cause, Consequence and Cure," read before the New York Medico-Legal Society, October 20, 1897 (*N. Y. Medical Record*, Nov. 13, 1897), attention was called to some points peculiar to this neurosis in women.

From its heredity she is more often exempt than man. We know families in which the sons

* Read at the Annual Meeting of the American Association for the Cure of Inebriety, Boston.

inherit the father's inebriety almost as naturally as they do his name or fortune, while the daughters show the strongest repugnance for the poison, especially if the mother be the inebriate. From physical ill health and discomfort she seeks relief in the delusive draft, and so tends swiftly and surely to cross the line where volition ends and disease begins, thus proving anew the popular error as to mere vicious indulgence. Secret drinking is the rock upon which many a woman's life is wrecked. With innate modesty she shrinks from publicity, and often so skilfully hides this weakness from family, friends and even her physician that ere they are aware, she is a confirmed inebriate.

Such a case was brought to my care the past year. Mrs. A., age twenty-nine years, of good ancestry and training, began taking beer by medical advice seven years ago as an aid to lactation. From this she indulged in wine and stronger drinks, in increasing amounts, until for nearly a year before coming under treatment, she was drinking one quart of whisky each day. As to be expected, the havoc from such excess was soon in evidence. Collapse came suddenly, with complete paraplegia and entire loss of power over bowel and bladder. Respiration was irregular and heart action weak—120 and over. There was general anesthesia, incoordination of arms and fingers, and the special pains of alcoholism girdling limbs about the joints. Two years ago she began having attacks of petit mal in the early morning before rising, and these continued, at irregular intervals, until the whisky was entirely withheld. Amnesia was a special feature, making her family think her insane, and despair of her recovery. There were visual hallucinations, with delusions of persecutions, great fear of poisoning, and memory was a complete blank. It was the most pronounced and pitiable case of alcoholic excess I ever knew.

As a prelude to special treatment, active measures were taken to eliminate the poison through every possible channel. Under tonic treatment she improved slowly, but surely. Full feeding, much milk and malt were continued for months. Strychnine nitrate, with solution of arsenic and gold—arsenaura—were given. Electricity, massage and suggestion were used. At the end of four months she had so far recovered as to leave sanitarium care, and return home, where, under glycerophosphates, she continues to improve.

Some points in this story merit more than passing notice. The risk in some cases of prescribing even beer, is large. The need of careful search in obscure and recurring illness, to settle the question of secret drinking, is obvious. The relation of alcoholism to epilepsy is of great interest and far-reaching import. Certain facts in recent papers by Dr. Crothers and Dr. Louise Robinovitch prove a close connection between these neuroses. Not only is the toxic power of alcohol acutely genetic, but the chronic curse is so marked that 64 per cent. of epileptics have an alcoholic ancestry. The wisdom of limiting offspring in such patients as Mrs. A. for several years, till the system has regained its own, is also obvious. Lastly, the result proves the value of well-directed, persistent treatment, and should promote optimism in those inclined to think such cases beyond the reach of the healing art.

ALCOHOLIC TOXEMIA: ITS PATHOLOGY AND TREATMENT.

BY THOMAS D. CROTHERS, M.D.,
OF HARTFORD, CONN.;
SUPT. WALNUT LODGE HOSPITAL, ETC.

IT may now be taken as demonstrated that the various affections of the body and mind which are produced directly or indirectly by alcoholism are due to toxemia. A study of the pathology of such diseases shows that alcohol acts in a very similar manner to other poisons. The effects may be the result of one or two glasses of spirits or of a long course of drinking. They differ of course in degree, but are more or less the same in character. This fact having been established, it becomes essential that the profession should revise and indeed revolutionize its method of dealing with such conditions. There are no affections in modern times that call so frequently for medical care as those traceable to alcohol, and none which are treated so inefficiently and dangerously, because of the false conception that has hitherto prevailed as to their origin and cure.

The first mention of delirium tremens, as such, in medical literature was made by Dr. Thomas Sutton, of London, in 1813. Twenty years later the term found its way into the text-books, from which it is now commencing to drop out. It is in reality a rare disease, though other forms of alcoholism, which are often confused with it, are sufficiently common. The characteristic features of delirium tremens are muscular trembling and peculiar delusions. The general name for such diseases as a class is alcoholism.

A word as to the etiology of so-called alcoholism and diseases following it. These diseases are commonly supposed to result from alcohol alone. This is an error; the same symptoms follow diverse and most complex causes. Thus a man who has been thrown from a wagon and stunned, on recovering commences to "see sights and hear sounds," and if he is known to have been a drinking man the delusions are at once put down to alcohol. Yet, the alcoholism may have been only an indirect and predisposing cause, the direct cause being the traumatism. The pathological changes which follow alcoholism are alike, and resemble those which follow from other causes, as for example, traumatisms, infectious diseases, fevers, inflammations and some other acute diseases. In all cases followed by delirium, there are clearly states of narcosis for which toxins are largely responsible.

The progress of different cases varies widely, the disease sometimes extending over years, while at other times it lasts only a short time, but there

are the same general symptoms in all serious cases. Thus if a man suddenly develops delusions —thinking he hears sounds that no one else hears, or sees things which are non-existent, and if afterward he gets into a state of violent excitement accompanied by muscular trembling, the prognosis is more or less grave. If, on the other hand, he wakes up confused, wondering where he is, and who other people are that are in the room, the probability is that the condition is transient and will soon pass away; but it is none the less evident that a pathological change has taken place. The toxemia is present in both cases. When the symptoms take the form of so-called delirium tremens, it shows that organic changes have occurred of a serious character.

In all these cases alcohol acts first on the blood vessels. The vasomotor nerves surrounding the blood vessels become paralyzed. They alternately dilate and contract, breaking up the uniform flow of the blood and diminishing the nutrition of the artery. Then follows mechanical obstruction, with increased labor of the heart, also increased tension and feebleness. This condition is followed very soon by other changes due to the failure of nourishment. The coating of the arteries becomes thickened or thinned at different points and fibrous deposits form, producing sclerosis. This process is more prominent in the arteries of the brain, but corresponding changes may occur all over the body. As a result the heart increases in size and becomes hypertrophied, and cirrhosis of the liver and other serious affections of like character occur. The men seen on the street with extremely red congested faces are suffering more or less from vasomotor paralysis. Later on venous congestion will appear, and the whole circulatory system will become deranged, because oxidization has diminished.

Secondly, alcohol acts on the blood, reducing the number of red corpuscles which carry the oxygen. At the same time the number of white corpuscles is increased. Their lives become shorter and shorter, and ultimately they divide and subdivide, destroying the material that was intended to give nourishment to the blood vessels.

Alcohol, in the third place, acts on the nervous tissue, producing the condition which is commonly known as neuritis. A person long given to alcoholic indulgence complains of pains in the legs, or arms, or other parts of the body. It is called rheumatism, and very frequently he is treated for that. In reality, it is neuritis. It is a very common disease—beer drinkers in particular suffer from it; but it is seldom diagnosed as such. Most frequently, it is supposed to be rheumatism, and the patient is treated accordingly with all sorts of drugs and outward applications. At the same time, he continues drinking, and therefore it is not surprising that he does not improve. All the while that he is taking medicines given by his physician to remove the symptoms, he is feeding the toxins which produce them.

In regard to the action of alcohol on the blood cells some interesting experiments have been made on dogs, which were given certain quantities of alcohol and afterward killed. An examination of the brain cells of these dogs showed that the same changes had taken place that occur in animals subjected to excessive fatigue. Thus there was a shrinking of the coats of the nerves and a consequent corrugation of the nerve cells; and anemia and sclerosis followed. Yet recently, at the Academy of Medicine, a doctor read a paper on the subject of arteriosclerosis, and mentioned spirits as a good remedy for this disease. In other words, for the cure of a condition of anemia and fatigue he ordered a drug which produces the same pathological conditions. The same speaker incidently mentioned that a large proportion of those who died from arteriosclerosis were physicians. In fact he said it was peculiarly a doctor's disease, and the cause he suggested was worry! Perhaps worry may have something to do with it, but it is also possible that doctors like other people indulge too much in the use of stimulants.

Another curious fact which may be touched upon in passing is that statistics show that in modern times the mortality from delirium tremens has been reduced from 50 per cent. to 10 per cent., while the mortality from other forms of alcoholism, which used to be 10 per cent., has increased to 50, 60 or perhaps 70 per cent.

Having given this general statement of the results of alcoholism, we come to the important question of treatment. The usual custom is to take away the alcohol gradually with the view of avoiding shock, and then to give the patient narcotics for the purpose of keeping him asleep. I do not believe there is any basis for these theories. The removal of the alcohol is the first thing to be attended to. It should be stopped entirely and at once. There is no shock caused by the taking away of other poisons. Why should we apprehend it in the case of alcohol? What danger there is arises from the fact that, by stopping the production of alcoholic toxins, you may give more room for the play of other toxic agents. These, however, must be dealt with as they arise: the first thing is to remove the alcohol, which is the main cause of the general toxemia. The toxins generally may be expelled from the system by elimination. With a view to this the bowels should be opened by means of salines, and baths and other means used to stimulate the pores of the skin. These two things are absolutely essential—sharp purgation and sweating. The best results follow from prolonged and continuous elimination by this double process.

As to narcotics, I make a point of not giving any drugs of this class until the toxins have been expelled, and neither do I give food until the acute stage has been passed.

When, however, the patient is convalescent, attacks of insomnia may occur, and to relieve these, special treatment, including some of the milder sedatives, may be necessary. In this connection I have found some of the coal-tar products

useful, and good results have been obtained from chloretone. This is a tertiary butylic alcohol of the anesthetic group, and appears to have very marked value where other drugs are impotent. In the insomnia which follows the withdrawal of opium as well as alcohol it works well, without producing any of the unpleasant after-effects which so commonly result from the use of other narcotics. I have given chloretone freely, and not noticed any cumulative action. Its hypnotic effect becomes apparent within half an hour or more. In the so-called delirium tremens, after the bowels have been freely moved and free perspiration established, and the delirium has subsided, it may be given in large doses of fifteen or twenty grains. I may add that it is best given at night. The anesthetic action of the drug is favored by external circumstances. Other narcotics may be given during the day, but chloretone is more effective and pleasing as a night dose. For the neuritis and lumbago so common in alcoholic cases, it is especially indicated, giving in many cases almost absolute relief. Its anesthetic effects seem very general. I have not noticed any resultant trouble in the stomach or derangement of the processes of nutrition. Professor Wilcox, who has written an exhaustive article on the subject, suggests that, as a result of the action of the drug the dendritic filaments lose touch of one another, and the protoplasmic processes are thrown out of contact with the motor cells—sleep, in other words, being produced by cell retraction. My personal experience is that after the drug has been administered, the patient's excitement and irritation quickly subside—not always to the point of sleep or unconsciousness, but at all events to a condition of serenity and quiet dreamy relaxation. So far I have not heard of any bad effects following its use, and therefore I would be disposed to place it among the safest as well as most reliable of the anesthetics and hypnotics now on the market.

The after-treatment should continue—the salines and baths, the latter daily, and with this the bitter tonics of which cinchona is the best. Arsenic is a valuable remedy, and the same may be said of some forms of phosphoric acid. For the alcoholic craze strong infusions of quassia will be found effective. All other remedies should be subordinate to means and measures which act on the skin and encourage elimination. Often this general treatment should be continued for a long time.

INFANT FEEDING—A SCIENCE AND ART.

BY JOHN F. CONNORS, A.M., M.D.,
OF NEW YORK.

Science of Feeding.—No subject can be more interesting to the student or general practitioner than the scientific artificial feeding of infants, but the perplexing question is to know what is a scientific method of infant feeding. So many methods have been advocated and the authorities can be quoted with such positiveness both for and against some of the methods, that all attempts at harmonizing different views fail. If this state of affairs means anything, it means that infant feeding is not governed by hard and fast rules.

Peptonized, sterilized, Pasteurized, humanized and modified cow's milk have all been the fashion and each has developed drawbacks. At a superficial glance exact percentage modification of milk looks very plausible, and yet there are few authorities to-day who believe that exact percentages of the different ingredients of cow's milk in the infant's food is the solution of the infant feeding problem. Indeed, Wentworth has shown that feeding mixtures put up in a laboratory, which is supposed to stand for exactness, vary greatly in composition from the prescriptions. If exactness of composition has any value and it cannot be obtained in laboratory feeding it might as well be dismissed as unattainable.

The latest scheme is the so-called differential modification of the proteids of cow's milk so as to resemble those of human milk, it being assumed that the proteids of the two milks are caseinogen and lactalbumin, which vary in relative and actual quantities in the two milks. This looks beautifully simple on paper but ends there. An hour's laboratory work in comparing cow's milk and human milk would do more to clear up this subject in the student's mind than reading a dozen theoretical papers.

Dilute a specimen of cow's milk with three parts of water; add acetic acid until a precipitate ceases to form; allow to settle and filter. Fat and casein will be on the filter paper. Boil the filtrate, and albumin will coagulate. Again filter, and to the filtrate add common salt nearly to saturation, and then a strong solution of tannic acid and albumoses and peptones will precipitate. Dilute another specimen of the milk with one part of water in a cup or bowl, add a drop or two of liquid rennet and slightly acidify with acetic or dilute hydrochloric acid. Now warm up to blood heat and notice the *clotting and shrinking* of the curd during five or ten minutes. Remove the curd and toss it about and notice how leathery it becomes. Repeat the experiments with breast mlk and the vast chemical and physical differences between cow's milk and human milk will be appreciated. Furthermore, it has been found that after injecting milk subcutaneously or intraperitoneally into an animal, a serum can be obtained that will precipitate the proteids of that milk and of no other. According to Vaughn and Novy "the serum of animals that have been treated as described with milk, is designated as lacto serum, and it has been found that the lacto sera are in all cases specific in their reaction. Indeed, the discovery of this reaction has shown that the proteids of the milk of different species of animals differ from those of every other species, and it certainly should convince us that it is impossible by any chemical process to make cow's milk a perfect substitute

for the mother's milk in the feeding of infants." Rennet and the acid which cause the proteid of milk to curd are found in the gastric juice, so it will be seen that after milk enters the stomach it naturally ceases to be a "fluid diet." It has been known for a long time that the milks of different species of animals had different curding properties. Chapin has recently called attention to the fact that the curding of milk is to develop the motor functions of the digestive tract, the milk of each species of animals curding in the stomach so as to develop the motor functions peculiar to that species.

The profound effect on nutrition that the failure to develop this function may have, has been shown by some experiments on calves, mentioned by Henry. They ate enormous quantities of milk and grain, but failed to thrive. One calf was given some straw with its food and in a few hours was chewing its cud and thrived thereafter; another calf was not given any coarse bulky food and died. Holt says that some infants who do not thrive on low proteids (highly diluted milk) thrive if less food is given in a more concentrated form (high proteids) which would produce a bulkier curd and thus call forth more mechanical effort. For this reason it is easy to see why peptonized milk in which no curd forms is not suitable as a steady diet for an infant. The formation of a soft curd in the stomach is natural and essential to the normal development of the infant's digestive tract. The essential difference between cow's milk and human milk is in the quantity and character of the curd formed from the proteid by the action of the gastric juice and this difference can not be adjusted by simply varying the percentage or quantity of proteid in the infant's food. Digestion in the cow is a very slow process and in the human being much more rapid. Proteid of cow's milk is much more slowly digested than the proteid of human milk. Nature has a purpose in this, viz., to prepare the undeveloped digestive tract for its future work.

As it is impossible to make human milk, it is essential that there should be some basis for feeding about which there can be no dispute. In this connection it is fortunate that investigators in the nutrition of the lower animals have arrived at some of the same conclusions that have been arrived at in infant nutrition.

Jordan, in his book "The Feeding of Animals," says: "It is time to break away, if we have not already done so, from an undiscriminating adherence to mathematical doses of nutrients, the accuracy of which is supposed by some to outweigh all other considerations and to determine success in feeding. . . . No working animal can be successfully fed by mechanical rules. . . . The ration must be adapted to the species. . . . A ration may be chemically right but practically wrong. . . . The nitrogenous tissues are those that largely determine the vigor and quality of any animal, and as these are formed rapidly in the early stages of growth, a normal and unrestricted growth demands an abundant supply of proteid food. . . . The study of the requirements of the individual animal and the adapting of food to its needs is to be preferred to placing the herd as a whole upon any inflexible ration. . . . Clearly the physiological standards may supplement, and in some measure guide judgment, but cannot take its place. . . . Palatableness is an important factor in successful feeding. Without doubt the success of one feeder as compared with the failure of another may sometimes be due, in part, to a superior manner of presenting a ration, . . . and to manipulations that add to the agreeableness of its flavors."

Holt says: "Success in infant feeding is largely a question of close observation and careful attention to details. . . . Not much is to be expected from fractional variations in the milk percentages when those given are producing a great deal of disturbance. . . . One whose digestion has become seriously deranged while taking milk is sometimes helped by nothing so much as temporarily withdrawing all milk. Such a course is often better than wasting time in juggling with fractional milk percentages, when one or two intelligent trials have been entirely unsuccessful. . . . The most brilliant results are often obtained from as complete a change in diet as possible. . . . Nothing but personal experience will enable one to judge aright as to the combination best suited to the existing conditions. In any case the first prescription must be an experiment. . . . Except to start with too high proteids no more common mistake is made than to continue long with too low proteids. Anemia, malnutrition, and, I believe, not infrequently scurvy, are seen as a consequence of this practice."

Holt's observation as to the effect of low proteids has been experimentally confirmed on pigs many times. The pigs fed low proteids were fat, anemic, stunted, rachitic and in every way poorly developed and of low vitality, being very susceptible to the ravages of hog cholera, while those fed on high proteids were strong, muscular and of great vigor.

It will, therefore, be concluded that the chief requisites of a successful infant feeder are a knowledge of the principles of nutrition especially as they apply to infancy, and an abundance of common sense. He must work out the details of each case and not feel that he has mastered the subject when he has learned some formulas for modifying milk.

Theoretically an infant's food should furnish about the same quantities of fat, proteids, carbohydrates and mineral matter as breast milk, and should also have the property of developing the motor functions of the digestive tract. Cow's milk is by common consent the best basic material to work with. Unfortunately it is very often both chemically and practically wrong. To make it practically right (digestible) by reducing the proteids it may be made chemically wrong

and when made chemically right it may be practically wrong. If all infants could digest cow's milk there would be few cases of malnutrition. The aim in infant feeding should be to get the infant to take plain cow's milk as soon as possible. How soon this can be accomplished depends on the individual infant. In most cases it will not be before the end of the first year and may be longer. By beginning with diluted milk and reducing the dilution gradually, the proportion of milk the infant receives is increased as fast as it can digest it.

In diluting the milk the proteids are reduced to a low point, and every effort should be made to allow as much as possible of the proteid to be converted into tissue. This can be done by making up the fat and sugar that have been reduced in quantity by diluting the milk. When this is done the infant gets practically cow's milk with the indigestible element, proteid, reduced in quantity. It is to accomplish this purpose that the various milk, cream and sugar mixtures have been proposed, and the many mathematical tables devised for calculating the proper quantities to combine. The simplest method that could be employed would be to dilute milk which was extraordinarily rich in fat or cream and add sugar. By the use of bottled milk and the Chapin dipper this method can be employed wherever there is average intelligence.

If the fat in the infant's food is to be kept up to anything like the amount in breast milk, the cow's milk that is to be diluted much must be rich in fat; that to be diluted less, poorer in fat.

One thing that the practitioner should dismiss from his mind is the idea that he can get milk or cream of definite richness unless he makes an assay of each specimen he uses, which is neither feasible nor necessary. Milks of different dairymen differ in richness, and a little experience with the Babcock Milk Tester in testing the milk from a number of dairies would show of how little value in practice are tables showing the *average* richness of milk and cream in fat.

The problem is to fit the milk at hand to the infant under consideration and a direct trial is the only way to find what strength of food can be taken.

In cities a high grade of milk can be obtained in bottles. In the country the dairyman should be instructed to bottle his milk as soon as possible after milking, and set the bottles on ice or in cold water to rapidly cool the milk. This will greatly retard the growth of the bacteria in the milk and will also promote a rapid separation of the cream.

After the cream has risen the top 9 ounces in the bottle when removed and mixed, will be *three* times as rich in fat as the original milk was; the top 14 to 16 ounces *two* times as rich, and the top 20 ounces *one and one half* times as rich. The proteids and sugar in these top milks are about the same as in whole milk. By mixing the cream and milk in the bottle whole milk will be obtained; by removing the cream, skimmed milk nearly fat-free will remain. By using bottled milk the milk is kept freer from contamination, bacterial growth is retarded and milk of almost any desired *proportional* richness in fat can be had without any mental effort. The actual richness of the top milks will vary directly with the richness of the original milk. Whole milk contains anywhere between 3 per cent. and 5 per cent. fat, so the top 9, 15 and 20 ounces will contain respectively 3, 2 and 1½ times these percentages. The top 9 ounces 9 to 15 per cent. fat, top 14 to 16 ounces 6 to 10 per cent., top 20 ounces 4½ to 7½ per cent. For the infant all changes are made by varying the dilution of the top milks and adding sugar, so in practice the richness of the milk makes little difference. In every case the milk is diluted to suit the infant's digestive capacity.

The proportional richness of these quantities from the bottle has been shown to be correct by Chapin, Holt, Judson, Gittings and Wentworth. The only error that can be made is getting less fat in the food some days, which would happen if the cream had not risen completely. This error would always be on the safe side.

To bring the sugar up to the necessary amount, 5 per cent., or one part of sugar to 20 parts of food is added for all dilutions greater than one part of milk to two parts of diluent. One part to 30 or 40 parts for less diluted food.

For removing these top milks a flat bottomed dipper is to be preferred, as it will stand up alone, when the first ounce is taken out of the bottle with a teaspoon, which usually requires the use of both hands. It is surprising how little the cream is disturbed by inserting the dipper. The skimmed milk often shows not over .4 per cent. fat.

The following table will show how to begin with a small quantity of a weak food and gradually increase the quantity and strength without any calculations by simply diluting the milk, also the range of composition of the mixtures when poor or rich milk is used.

	COMPOSITION.				INGREDIENTS.		
Number and size of feedings	Fat %		Proteids %	Sugar %			
	Poor milk	Rich milk	Poor milk	Rich milk		Milk	Diluent	Sugar
12—2 ozs.	1.50—2.50		.50— .66	6.00	Dip off top 9 ozs. and use	4 ozs.	20 ozs.	1 oz.
10—3 ozs.	1.80—3.00		.60— .80	6.00	of this	6 ozs.	24 ozs.	1½ ozs.
9—4 ozs.	2.25—3.75		.75—1.00	6.00	Top	9 ozs.	27 ozs.	2 ozs.
8—5 ozs.	2.20—3.60		1.00—1.33	6.00	Top	13 ozs.	27 ozs.	2 ozs.
7—5½ ozs.	2.20—3.60		1.20—1.60	6.00	Top	16 ozs.	24 ozs.	1½ ozs.
6—7 ozs.	2.25—3.75		1.50—2.00	6.00	Top	20 ozs.	20 ozs.	1½ ozs.
4—8 ozs.	2.00—3.30		2.00—2.70	6.00	Whole milk	32ozs.	16 ozs.	1½ ozs.
Whole milk ad. lib.	3.00—5.00		3.00—4.00	5.00	Whole	milk		

In measuring the sugar two level tablespoonfuls of granulated or three of milk sugar equal one ounce.

If whole milk is used in making up all mixtures the range of composition for any dilution can be found by dividing the composition of whole milk —fat 3 to 5 per cent.; proteids 3 to 4 per cent.; sugar by 4 to 5 per cent., the number of times the milk is diluted. In diluted whole milk the proteids would be about the same as if the top milks were used, but of course the fat would be less. It will be noticed that the proteids in the feeding mixtures are increased from .1 to .3 per cent. at a time during the reducing of the dilution from 1 to 5 to 1—1 which is all that could be desired in small fractions. The fat in these mixtures is kept rather low, as experience shows that running the fat up too high greatly interferes with digestion.

It will be seen that in the high dilutions of milk the amount of proteid in the food is much less than the quantity found in breast milk (1.5 per cent. to 1.75 per cent.). As the infant's vigor and vitality depends on the quantity of proteid stored up, any method to increase the quantity of proteid the infant can digest should be employed.

It is now accepted that cow's milk is rendered much more digestible by dilution with cereal gruels, partly on account of their mechanical action on the curds and partly on account of their stimulating the digestive process. Oatmeal, barley, wheat or rice may be used in preparing the gruels. Sometimes one agrees better than another. If the plain gruels are used, they must be made quite thin, but if the gruels are dextrinized they should be made quite thick and then dextrinized by the addition of cereo. By this process the starch is rendered soluble, and the amount of proteid in the gruel is about double that in plain gruel. These dextrinized gruels have the same mechanical effect on the curds as the thin plain gruels and add considerable digestible proteid to the diluted milk. The clinical effect of the use of dextrinized gruel as a diluent is best seen in marasmus and subacute gastro-enteric catarrh. Oftentimes infants will take food prepared with this diluent with eagerness and thrive on it when they fail to do well on the same mixture with water diluent. In nearly all cases where milk must be discontinued temporarily, dextrinized gruel will be found useful.

Whey has a value as a temporary substitute for milk, but as a steady diet has the disadvantages of peptonized milk in that it does not develop the motor function of the stomach.

Sterilization and Pasteurization of the infant's food have been strongly advocated on the ground that cow's milk contained innumerable bacteria while breast milk was free from them. Later investigations have shown that it is more the character of the bacteria present than the number, that cause sickness in infants. Baginsky has recently advocated feeding infants buttermilk and has reported 182 cases so fed. In preparing this food a pure culture of lactic acid bacteria was added and allowed to develop lactic acid enough to sour the cream. Bacterial counts of sour cream from which buttermilk is made have shown as high as 1,500,000,000 bacteria per c.c., mostly of the lactic acid class, and yet infants thrive on buttermilk.

The bacteria that produce poisonous products come from filth. These may gain access to the milk, or to the infant's digestive tract in the home, as is shown by infants being attacked who are taking the breast or condensed milk. Much of the ordinary milk supply does not seem to contain harmful bacteria. However, sterilization and Pasteurization have practical advantages in addition to destroying the harmful bacteria that may be present, and will always be necessary in hot weather unless milk quite free from bacteria is obtained and kept on ice until used. In the experiments in curding milk previously mentioned, the milk was slightly acidified *after* the rennet was added and it was the acid that caused the curds of cow's milk to shrink rapidly and become leathery. In hot weather it is difficult to keep the milk or food so that the lactic acid bacteria which are almost always present will not develop some acid. When such food is taken into the stomach the milk quickly curds with rennet, and the lactic bacteria at the body temperature rapidly produce more acid, which causes the curds to contract and toughen. After this contraction has taken place the curds become very indigestible and form a good culture field for any harmful bacteria present in the milk or digestive tract. In buttermilk enough acid has been produced to precipitate the casein, which will not then form a solid clot with rennet. Thus a small quantity of acid toughens the curds while a large quantity prevents their formation.

Pasteurization is useful in hot weather not because it makes the milk more digestible, but because it kills the acid producing bacteria which make the milk curds less digestible.

It should be remembered that Pasteurized milk a day or two old may cause vomiting and diarrhea as a result of the growth of putrefactive bacteria not destroyed.

Art of Feeding.—When it comes to the management of a particular case, there should first of all be taken into consideration the intelligence of the mother or nurse and their willingness to carry out instructions.

A child of nervous parents will require a great deal more care and attention to details than a child of laboring parents. The *method* of feeding employed in one case may have to be very different from that of the other; yet the problem is the same in both cases.

When starting a well infant in an intelligent family on artificial feeding, the plan of commencing with diluted top milk as previously mentioned will generally be successful. The increase in the strength of the food should be gradual and the infant should give evidence of being happy and contented, that is, sleep well, have good stools and gain in weight. Regularity in the hours of feeding should be insisted on. If the infant is nervous, efforts should be made

to keep it free from excitement as this will greatly interfere with digestion.

When the use of top milk is out of the question, whole milk may be diluted two to six times and one part of sugar added to 20 parts of food and the mixture Pasteurized or brought to a boil and then cooled. In summer time it may be best not to use top milk for any cases, especially if there is a tendency to vomiting. Where even diluted whole milk cannot be prepared properly, condensed milk is the only thing that can be employed, although it is not the best food from a nutritive standpoint.

Cleanliness of bottles, nipples and everything pertaining to the infant are important factors in successful feeding.

In the management of cases where there is much gastric or intestinal disturbance, much time and patience are required and it may be necessary to see the infant and examine its stools every day. The best plan is to stop all milk food and wash the stomach, as, according to Herter, much of the mucus that is mixed with the fecal matter comes from the stomach. Feed very thin barley water, a teaspoonful of barley flour to the pint, for twenty-four hours or until vomiting ceases. Then increase the strength of the gruel to one to two rounded tablespoonfuls of barley or rice flour to the pint and dextrinize. Keep on this for two or three days and then add *one* teaspoonful of plain or even skimmed milk to a two-ounce feeding; the second day try two teaspoonfuls of milk to two ounce feeding and so increase the amount of milk. Later the top 20 ounces from a quart of milk may be used for diluting and then the top 16 ounces. This will bring up the fats. Sugar should be added cautiously.

If one teaspoonful of plain or skimmed milk to a two ounce feeding is not tolerated the same quantity of condensed milk may be tried. If this succeeds, equal quantities of cream from bottled milk, and condensed milk should be mixed and diluted. The addition of the cream overcomes some of the objections to condensed milk which by itself is a one-sided diet, low in fats and proteids but high in sugars. Whey may be of temporary use in these cases.

A class of cases is seen in which the food is taken with indifference and while fairly well digested, does not seem to build up the infant. In this class of cases the use of mutton or chicken broth, beef juice with dextrinized gruel diluents, or anything that appeals to the appetite is indicated. Efforts should be made to vary the flavor of the food and so arouse interest in the bottle.

Constipation should be overcome by using oatmeal in making the diluent, and by giving well-cooked and strained prunes to increase the intestinal secretion in preference to increasing the quantity of fat so that it acts as a laxative.

Whenever there is a rise of temperature with a diarrhea, castor oil should be given and all milk stopped until temperature and stools are normal, when the feeding may be resumed as mentioned for difficult cases. That a great reduction in the death-rate from diarrheal diseases is possible by this treatment has been conclusively proven by Kerley.

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117 West Eighty-third Street.

A CASE OF PANOPHTHALMITIS IN TYPHOID FEVER.*

BY W. WHITEHEAD GILFILLAN, M.D.,

OF NEW YORK;

FELLOW OF THE N. Y. ACADEMY OF MEDICINE; VISITING OPHTHALMIC SURGEON TO THE CITY AND FRENCH HOSPITALS; OCULIST TO THE SAILORS' SNUG HARBOR AND THE HOUSE OF REFUGE; ASSISTANT SURGEON TO THE MANHATTAN EYE AND EAR HOSPITAL, ETC.

PANOPHTHALMITIS is an inflammation of all the tissues of the eyeball. It may be caused by infection from without due to penetrating injuries or unsuccessful operations. This is by far the most frequent cause. It may also be produced by infection from within through embolism, septic substances from a focus of suppuration getting into the circulation and becoming arrested in the vessels of the choroid and other diseases. The case reported here is of the latter class.

Panophthalmitis is one of the most painful of eye diseases. Fortunately we do not observe it frequently. In the treatment of 20,000 cases in our eye hospitals about six or eight cases will be seen. Nearly all of these being due to the causes first mentioned. It is well we meet it no more frequently, as it is very destructive to the eye. The sight not only is lost, but also the shape, which results in a shrunken eyeball (Phthisis bulbi). The inflammation may extend to the meninges and brain and produce death. This is a rare occurrence however.

When the inflammation gets well established there is nothing that can be done to save the sight. Panophthalmitis complicating typhoid fever is a very rare occurrence. Less than a dozen cases have been reported.

The patient, a young man thirty-one years of age, entered the medical service of Dr. Van Horn Norrie at the City Hospital, Blackwell's Island, August 25, 1902. I am indebted to Dr. Norrie for his kindness in letting me report this case, and also to his house physician, Dr. H. M. Little, in giving me the full history and temperature chart.

The patient had complained of loss of appetite, pain in the abdomen, vomiting and diarrhea for the two weeks preceding his admission to the hospital. These symptoms continued. The temperature was 103° F., pulse 100 and respiration 28. Examination of the urine showed it to be alkaline. Specific gravity 1.015, and a small amount of al-

* Read before the Society of the Alumni of the City (Charity) Hospital, March 11, 1903.

bumin. The microscope revealed a few hyaline and granular casts. He was fairly well nourished but his cheeks were flushed and the expression apathetic as well as the mucous membranes being pale. The tongue was coated.

The left eye, the one which was subsequently affected by panophthalmitis, had no sight. This was due to an injury received some seventeen years before resulting in an occlusion of the pupil. The diagnosis of typhoid was made.

August 27, two days after admission, a test was made of the blood. It showed Widal's reaction for typhoid in dilution of 1 to 20; leucocyte count 3,000.

August 29. Patient was very delirious during the past night and quite irrational this morning. Leucocyte count to-day, 2,600.

August 31. Abdomen distended and tympanitic.

Sept. 1. Pulse slightly irregular and weak.

Sept. 2. Tympanitis has disappeared. Pulse much improved.

Sept. 5. This is the twenty-sixth day of the disease. To-day the outer part of the conjunctiva of the left eye is somewhat swollen and edematous; no discharge; a saturated solution of boric acid ordered every four hours, and ice applications every other hour to the eye. At five o'clock in the afternoon the eye was much worse. Lids, the upper one especially, very much swollen and edematous, with considerable redness of the skin. The conjunctiva is intensely reddened and likewise very edematous. The cornea dull with a diffused cloudiness. The eyeball is markedly protruded (exophthalmus); no discharge.

Sept. 6. Eye still further protruded and the tension is very much increased.

Sept. 9. The condition of the eye is the same except for a slight mucopurulent discharge. I was called in to-day to see the case and the diagnosis of panophthalmitis was made; patient very weak and unconscious. Treatment changed to hot applications, for fifteen minutes every half hour, to the eye.

Sept. 11. Eye somewhat improved. Discharge increased and more purulent in character. A small opening in the anterior sclera allows the discharge to escape.

Sept. 13. Eye much better; swelling of the lids much less; discharge continues free.

Sept. 16. Swelling of the lids entirely disappeared; eyeball beginning to contract; discharge less.

Sept. 29. Patient sitting up; discharge has stopped.

Oct. 3. Eye much shrunken; treatment discontinued. Eye is now a phthisical one.

In regard to the typhoid condition, the patient ran a regular fever course as the temperature chart will show. The panophthalmitis ran a rapid course. The duration generally being about six weeks to two months, whereas in this case it took only a month.

Fortunately for the patient the disease affected the eye which already was blind, otherwise he would have been in a sad plight. I do not think the injury seventeeen years before had left any condition which would predispose to this disease.

It will be noticed that this complication did not begin until the twenty-sixth day of the fever. By this time the height of the fever had been passed.

The patient was treated by the cold bath method for his fever and was discharged cured from the hospital the last of October.

24 West Fifty-ninth Street.

MEDICAL PROGRESS.

SURGERY.

Diminution of the Sternocricoid Distance.—In the course of examination of a patient who had twice suffered injury to the cervical portion of the spinal column, with a resulting cervicodorsal kyphosis presumably compensatory to the subluxation or fracture of one of the vertebræ, A. FASQUELLE (Rev. de Chir., June 10, 1903) discovered a decided lessening of the distance between the superior border of the sternum and the cricoid cartilage. Inasmuch as radiography throws very little light upon affections of the spinal column, the author believes that measurement of the distance between the cricoid and sternum may be a valuable aid to the diagnosis of fracture, dislocation or sinking of the cervical portion of the spinal column. Out of 100 patients subjected to this test, he found the average space between the inferior border of the cricoid and the top of the sternum to be 45 mm.; whereas in the patient with the abnormal spine, the distance was but 15 mm.

Adrenalin in Cancer.—By reason of the vasoconstriction which it effects, adrenalin is capable of modifying the vascularization of cancerous tumors, writes C. FIESINGER (Jour. des Prat., April 25, 1903). In cancer of the rectum, painting twice daily with from 30 to 100 drops of a 1-in-1,000 solution of adrenalin in a tablespoonful of water decreases the accompanying rectitis, may check the discharge and brings about a temporary diminution in the size of the cancerous growth. External, ulcerated cancers become pale, decrease in volume, the hemorrhage may be checked and the progress of the affection is stayed for a time by the use of this remedy. Combined treatment with adrenalin, quinine and beer yeast is, in the author's opinion, distinctly serviceable in the prevention of recurrence after ablation of cancerous tumors. He reports the case of a woman operated upon in 1901 for cancer of the uterus, in whom, the operation being incomplete, a recurrence was expected. During 1901 and 1902 the patient was given quinine hydrochlorate 0.25 in cachet before breakfast and dinner, for five days, and a teaspoonful of beer yeast before meals the next five days; the two remedies being alternated thus for a month, at the end of which time treatment was suspended for five days and resumed in the same order. In 1902, adrenalin was added to the treatment, 5 to 10 drops of the 1-in-1,000 solution being given on rising and retiring the days on which the beer yeast was given. At the present writing, the patient continues to enjoy excellent health. In another case, operated upon three times for cancer of the breast, which recurred very shortly after each operation, this treatment was given, with the result that seven months have elapsed without a reappearance of the cancerous growth.

Calcareous Osseous Atrophy Following Traumatism.—The importance of radiographic examination in the study of the remote effects of fractures and contusions is urged by A. IMBERT and J. GAGNIÈRE (Rev. de

Chir., June 10, 1903) in order that the necessity for therapeutic treatment which would stimulate skeletal nutrition, may not be overlooked, and that the significance of such symptoms as pain, impaired function, etc., may be cleared up. Osseous affections of a certain duration are indicated radiographically by changes in transparency or form of the affected bone, or both. Thus syphilis or tuberculosis of the bone is accompanied by change of form and increased transparency; while in osteomyelitis the opacity of the bone to the X-rays is increased. On the other hand, osseous changes following fracture or even occcasionally traumatism of the soft parts alone, are indicated by increased transparency to the X-rays without change in the form of the bone. This transparency may be uniform or broken by opaque spots. In the authors' experience, there seems to be no relation between the site of the fracture and the resulting osseous atrophy, and of two fractures surgically identical as to site, mechanism of production and displacement of the fragments, one may be followed by osseous atrophy, while the normal mineralization of the bone may be preserved in the other. After compound fractures followed by suppuration, osseous atrophy is usually very pronounced and may extend some distance above and below the fractured point. Osseous atrophy is the rule when, after a simple fracture, consolidation or calcareous infiltration of the callus is retarded. The earliest date at which the existence of calcareous atrophy may be detected by the X-rays is four and a half weeks; and in one of the author's cases, repeated examination with the X-rays failed to reveal osseous atrophy till four months had elapsed.

Subdiaphragmatic Abscess of the Liver.—A method by which posterosuperior abscess of the liver may be reached and surgically treated without risk of contamination of the pleural or peritoneal cavities has been devised by P. MENDES (Rev. de Chir., June 10, 1903). He describes the operation as follows: The patient being placed upon the left side, an incision 12 mm. long was made along the ninth rib, starting from its junction with the cartilage. Two incisions, having their origin at the seventh intercostal space, were made to meet the two extremities of the first. The flap thus made was dissected and laid back, the eighth and ninth ribs laid bare, denuded of their periosteum and resected (the former to the extent of 8 cm., the latter 10 cm.) without injury to the pleura. With the finger, the parietal layer of the pleura was then stripped from the ribs below the incision as far as its reflection upon the diaphragm. Then raising, as far as possible, the cul-de-sac of the pleura, an incision was made in the diaphragm which gave egress to 423 gm. of pus. Two large drains were then inserted in the wound, these being removed upon the ninth day, and the wound was completely closed within a month. The author gives to his method the name parapleural transdiaphragmatic.

A New Process of Exenteratio Bulbi and Ocular Prosthesis.—The difficulty experienced by oculists in the substitution of a foreign body for the enucleated eyeball is due to the scanty support for such a body, writes A. FERRAR (Gazz. Siciliana di Med. e Chir., May 28, 1903). He describes a method of enucleation and prosthesis which he has successfully used in several cases and which he believes to be free from the objections of other methods. This consists in the preservation of the entire ocular capsule, that is, the cornea and sclera; the contents thereof being emptied through a linear incision of about 2 cm. made in the upper segment of the bulb parallel with its equator and about 4 mm. from the sclerocorneal junction. After the capsule is entirely emptied, the margins of the wound are approximated and sutured; one suture at the center of the wound being left untied so that a small aperture remains for the introduction of the point of a syringe filled with liquid paraffin. The capsule is completely distended with this substance, so that an artificial eyeball is formed, over which may be fitted a glass eye, capable of being moved naturally, owing to the fact that all the muscles are intact and their normal insertions are preserved. To check hemorrhage and avoid the danger of entrance of the paraffin into the central artery of the retina, the author proposes that a few drops of a 1-in-1,000 solution of adrenalin be instilled into the capsule prior to injection of the paraffin.

Ignition of Ether Vapor by an Electric Light.—Every surgeon thoroughly appreciates the danger of an open lamp anywhere near ether vapor but it is generally supposed that an electric incandescent light is perfectly harmless. To be sure, accidents from this cause are extremely rare, but D. H. MURRAY (N. Y. Med. Jour., June 27, 1903) reports an instance in which the ether vapor about a cone by which a patient was being anesthetized was ignited when an electric light was turned on nearby. The patient's hair was badly singed but no serious injury resulted. As there was no exposed fire or blaze in the operating room at the time it was concluded that the ignition resulted from the spark in the electric light, made when the contact took place in turning on the light. It is a possible danger worth remembering.

Splenectomy and Talma's Operation in Ascites of Malarial Origin.—Cases of excision of the spleen for various indications are becoming quite frequent, and Roeser in his last work on diseases of the spleen presents statistics of 200 operations. Among the indications we find prolapse of the spleen, rupture, various traumata, wandering spleen, abscesses and various new formations, hemorrhage, enlargement from malaria, splenic anemia, and even leucocytosis, and amyloid degeneration of the organ; finally splenectomy was recommended of late in Banti's disease. Last year Tausini hit upon the original idea of adding to a splenectomy Talma's operation, namely, remove the suspected focus of infection and create lateral paths for the disturbed abdominal circulation. FINKELSTEIN (Roussky Vratch, No. 22, 1903) performed successfully a similarly combined operation for an enlarged spleen with considerable ascites of malarial origin. The patient was a native of a malarial district of Caucasus, with a history of malarial infection of twelve years' duration. For the last thirteen months she began to suffer from a gradually increasing pain and swelling in the left subcostal region; to this were added considerable dyspnea, frequent and severe vomiting, and complete anorexia. The largest circumference of the abdomen was 116 cm. Operation performed three months after admission to the hospital (other measures of treatment having proved ineffective), and proved successful, as the pains disappeared, the abdominal circulation became equalized, and nutrition improved. The author considers as the most important element of the success the performance of Talma's operation whereby collateral circulation was established in the abdomen, and thus an end was put to the severe ascites. Postoperatively it is interesting to note that for the first ten days there was a rise of temperature in the form of a non-intermittent fever, later on this gave way to a series of typical malarial intermittent attacks, which finally yielded to internal administration of arsenic and to hypodermic injections of quinine. The author thinks, together with Michayloosky and Jonnesco, that the extirpation of a "malarial" spleen does not always rid the patient of malaria, and the attacks of malaria are not less severe in patients without spleens than in those with healthy organs. The prognosis of the operation may generally be considered as favorable. Février found out of 86

operated cases of extirpation of malarial non-wandering spleen 17 fatal issues. Out of 16 cases Michaloosky lost but one, and that was due to an accident (pneumonia with pleurisy). On the other hand, cases of extirpated spleen for other indications run a more favorable course, as when the operation is performed for movable, namely, wandering (floating) spleen, or one that became enlarged because of anemia; in Banti's disease 13 cases of operation gave 3 deaths. It is the opinion of a great number of observers (and among them very many Russians) that the removal of the spleen is not attended by any marked or vital disturbances of nutrition or other functions of the organism. It is doubtless that with more positive and exact indications demanding this operation, a minimum of fatality will be reached.

PEDIATRICS.

Feeding of Older Infants.—From the ages six to twelve months most infants are sufficiently developed to be able to digest cereal foods. Even when a high milk formula cannot be digested it is found that they may thrive on an easily digested and nutritious cereal mixed diet. W. M. HARTSHORN (Med. Rec., June 27, 1903) reports that in the Nursery and Child's Hospital during the past few months all babies over seven months, both artificially fed and nursed, whose digestion seemed able to stand extra feeding, were given some stronger food and it was found that of flaked rice, cream of wheat, oatmeal gruel, farina and bread and milk, the latter proved the most satisfactory. This was prepared from stale bread from twenty-four to forty-eight hours old. The pulp was soaked in boiling water until thoroughly softened and the water was poured off and a cup of milk added. This was then boiled for three or four minutes. After being sweetened and cooked sufficiently it was fed to the baby. At first it is given in teaspoonful doses but later it is increased until they may get from two to three ounces daily in feedings of not more than half an ounce at a time. Older children receive plain bread and milk once daily. In the morning they generally get farina with milk. At noon boiled rice with meat broth poured over it. Fruits are given in season. The weight charts are excellent evidence of the advantage of this extra feeding.

Examination of Milk by the General Practitioner.—Milk with an acidity of over two-tenths of one per cent. is not fit for drinking purposes. H. L. K. SHAW (Ann. of Gyn. and Ped., May, 1903) determines this either by a simplified titration method or by alkaline test tablets. The next step is to obtain its specific gravity. The author does this by means of a small Quevenne lactometer constructed with a thermometer. This is graduated from 1.020 to 1.050 and requires a little over half an ounce for a reading. The specific gravity of mother's milk averages 1.030 and is lowered by an increase of fat and raised by a high percentage of proteid. If the specific gravity of cow's milk is less than normal (1.029 at 60° F.), one of two things may be suspected. Either the milk contains an unusual amount of cream or the milk has been watered. If, on the other hand, the specific gravity is higher than normal and the percentage of fat is low, it is fair to assume that the milk has been skimmed. The percentage of fat is obtained in many ways, but the writer prefers the Babcock method. The percentage of sugar varies but little and its estimation is not required in an ordinary examination. The quantitative Fehling test employed in urinalysis may be used for this purpose. The total solids can be determined from the corrected specific gravity and the percentage of fats. The Babcock method consists of dividing the specific gravity of the milk by four and adding to this one-fifth the per cent. of fat. This will give the solids not fat, and adding the per cent. of fat to this product the amount of total solids is obtained. The amount of proteid can be estimated approximately by subtracting the percentages of fats, sugars and salts from the total solids. The Hehner and phloroglucin tests are recommended for the detection of formalin in milk.

THERAPEUTICS.

Calcium as a Hemostatic.—The differences of opinion as to the influence of calcium in increasing the coagulability of the blood seem to have been adjusted by the experimental work of T. SILVESTRI (Gazz. Osped., June 14, 1903), who finds that the influence of the drug depends upon the degree of concentration; large doses retarding coagulation while small doses increase it. In a series of experiments with the blood of sheep and calves it was proven by him that the addition to the blood in vitro of increasing doses of calcium chloride to the limit of 12 mgr., brought about progressive hastening of coagulation and a more retractile clot. Twenty milligrams represented the maximum dose from which coagulation was unchanged and beyond this limit, clotting was retarded. Subcutaneous injection, in a dog, of 40, 55, and 65 c.c. of a one-per-cent. solution of calcium chloride was followed by coagulation of blood, drawn from the femoral vein of the animal, in 15′, while 20, 25 and 30 c.c. induced clotting in 13′. Finally, blood from the cephalic vein of a patient subject to epistaxis was examined; the specimen coagulating in 12′, while administration of calcium hypophosphite per os gm. 7 daily induced coagulation in 9½′ and gm. 4 daily produced clotting in 9′.

Treatment of Whooping-cough.—Although this is a self-limited disease and seldom fatal, yet it becomes frequently a very distressing condition and on account of its interference with proper nutrition it demands most serious consideration. T. W. KILMER (N. Y. Med. Jour., June 20, 1903) believes that the medicinal treatment which has proven the most efficacious is that recommended by Dr. C. C. Kerley and consists in the alternate use of an antipyrine mixture and quinine. A child, two years old, is put on the following:

℞ Sodium Bromide..... gr. iij
Antipyrine ..... gr. j
Syr. Ipecac..... ♏ iv
Water .....q.s., ad. ℥i

This constitutes one dose and is given every two hours for three or four days. The child is then given three grains of quinine sulphate every three hours for three or four days and is then put back on the antipyrine mixture. The only drawback is the possibility of upsetting the stomach with the quinine. His greatest success in the treatment of this disease has been obtained, however, by the new application of an old principle by which the spasms are greatly controlled and the vomiting usually entirely eliminated. A stockinette band is placed upon the baby extending from the axillæ to the pubis and fitting snugly. Two shoulder straps are used to prevent the band from slipping down. Upon this stockinette band a single width of elastic bandage is sewn, extending entirely around the body and covering the abdomen. It is sewn on when very slightly on the stretch and if not successful should be drawn a little more snugly. This simple measure will almost always entirely control the vomiting seen especially in nurslings. Such a band, furthermore, when applied around the chest is of marked advantage in aborting the paroxysmal stage and the two bands may thus be combined. The only disadvantage of the method is that in some cases a slight eczema is caused upon the underlying skin, but this readily clears up as soon as the band is removed.

HISTOLOGY, PATHOLOGY AND BACTERIOLOGY.

Tuberculous Antitoxin Per Os.—Following up the work of Italo, who obtained a certain increase in the antitoxic power of the blood-serum of patients by administering to them tuberculous antitoxin by mouth, F. FIZARI (Gàzz. Osped., June 14, 1903) sought to determine whether the formed elements of the blood of animals immunized to tuberculosis were endowed with antitoxic properties and whether such elements, given by mouth, could impart resistance to tuberculous toxins. To this end, the clot of blood taken from immunized horses and cows was dried and reduced to powder, and 3 gm. daily administered to rabbits. The agglutinating power of the rabbits' serum was tested before and after a course of treatment with the powder, with the result that a marked increase in agglutinating power was seen after the treatment. As to the increase in antitoxic power, the following results are recorded: After eighty-five days' treatment, the rabbits were injected with mortal doses of tuberculin. Half the animals subjected to such injections lived for thirty-six hours while the control animals survived but twelve to sixteen hours. The remaining number survived and were in good health at the time of writing.

Callus Formation in the Fractures of Osteomalacia.—The manner in which the callus is formed in fractures during this disease has rarely been discussed in the literature of the subject and the views of the various authors differ greatly. I. BECKMANN (Deut. Archiv f. klin. Med., Vol. 76, No. 1) publishes two further cases from which some interesting results are drawn. The Roentgen rays were employed in the author's two cases and although the skiagraphs were taken several months after the injury, no signs of any callous formation were in evidence. In one case there was a very faint shadow around a fracture of the bones of the forearm, around which some degree of union seemed to have taken place, but the very slight deposit of lime salts permitted the rays to pass through without interference. In the other case the fragments were not in apposition, and the picture taken five months after the injury, showed absolutely no evidence of repair. The author thinks that the reason that in one case there seemed to be formation of a functional callus, but without the presence of lime-salts, while in the other there were absolutely no traces of a callus, is due to the fact that the osteomalacia in the former case had not advanced as far as in the latter. For it is a well-known fact that the further along the disease is advanced, the less likely is repair apt to take place. These observations also show that the X-rays afford a very effective means of gauging the stage to which the process has advanced, for in the first case the bone presented a spotted or marbled appearance, while in the other nothing could be detected of any bone structure. This may be of great value in doubtful instances.

Eberth's Bacilli in the Roseola of Typhoid Fever.—The eruption of typhoid fever is known as one of the important symptoms of the disease. As far back as 1880, Eberth, and after him Koch and Gaffky, found on investigation that the roseola of typhoid fever is the direct result of the poisonous element of the disease. In 1899 Neufeld substantiated the formerly expressed opinions of Neuhaus and Thiemisch, to the effect that the blood of the roseola contained a special kind of bacteria that cause the appearance of the eruption. These spots shelter, as it were, a certain number of viable bacilli which are here protected from the bactericidal power of the circulating blood. The investigations of Neufeld were later on carried out with the same results by Curshman. KAZARINOFF (Roussky Vratch, No. 22, 1903) conducted his experiments on 15 undoubted cases of typhoid fever, among whom 2 had the disease in a recurrent form, and in these the roseolæ were investigated twice. Omitting his methods of examination we can only stop here on the following results obtained by him: In the lymphatic vessels of the excised roseolæ there are found variously grouped a number of closely lying typhoid bacilli; the blood-vessels are free from them; the tissue containing the bacilli is considerably swollen, although not to the dimensions claimed by Fränkel; the number of cells is increased, but not through the addition of white corpuscles. No necrosis of the tissue was anywhere observed by the author. It thus becomes evident that in the eruption of typhoid fever we may see a process depending on inflammation and infiltration of the corium due to the emigration or rather transportation of the typhoid bacilli through the lymphatic vessels. In doubtful cases of febrile disease, when a positive diagnosis can not be established, it may be of some value, as suggested by Curshman, to examine the contents of a roseola, if such be detected.

Experimental Tuberculosis in the Dog and Resulting Toxemia.—The course of experimental tuberculosis produced in dogs by endovenous injections of virulent cultures of Koch's bacillus and the toxemia following such injections has been studied by CASAVECCHIA (Gazz. Osped., June 21, 1903). After a varying length of time the animals were killed, and examination revealed entire absence of tuberculous infection of the glands or viscera, save in the lungs, where a miliary bronchopneumonia was found; the bacilli having been arrested in the pulmonary circulation and destroyed, as proven by bacteriological examination. That a grave toxemia resulted from these injections was shown by the condition of the animal shortly after treatment, as well as by the marked increase in the hemolytic power of its serum toward the blood of rabbits, as compared with the hemolytic power shown by the same serum when the animal was in its normal state. In those animals which were allowed to live a greater length of time, a gradual improvement was seen, and examination of the lungs showed regression of the pathological process, from which the author concludes that with the destruction of the bacilli, elaboration of tuberculous toxines ceased, and as a result toxemia was eliminated; a like sequence occurring in those clinical cases which undergo spontaneous cure.

PHYSIOLOGY.

Influence of the Contents of the Large Intestine on Strychnine.—It is known that small quantities of strychnine added to the contents of the cecum and colon of normal rabbits, cannot be detected by Haines' method. In a number of control experiments, however, in which a smaller quantity (1 mg.) was mixed with gastric contents, liver, crushed brains or urine, the strychnine could be detected by the same methods. The conclusion was therefore drawn, that there was some substance present in the colon and cecum of normal rabbits which interfered with the methods of detecting the drug now at our disposal. The same author, W. SALANT (Am. Med., June 27, 1903), has now made some further expirements, and believes that the inability to find the strychnine in the first instance was due, not to anything in the intestinal contents, but to a faulty method. He explains this as follows: The various methods usually employed for the detection of the drug are very elaborate and require numerous manipulations. The solution is subjected to several filterings and reagents, before the alcohol is ready for the final tests. As only small quantities are present, the loss of even a minute portion may influence the result. The success of the same method in separating

strychnine from the mixtures of liver, brains, urine, etc., may be explained by the fact that organic impurities were not so numerous and filtration much better, therefore the manipulations were reduced in number. This may explain why in many cases of strychnine poisoning the alkaloid has not been found. The author outlines a simpler method for making the tests, by which he has succeeded in proving the presence of the drug in the intestinal contents, where the other methods had previously failed.

Contact-phenomena in Spermatozoa.—The motion of the spermatozoa in the uterine canal upward toward the openings of the Fallopian tubes, is supposed to be in response to the mechanical stimulus of the cilia lashing in the opposite direction. J. DEWITZ (C'blatt f. Physiol., May 23, 1903), who was the first to discover thigmotactic phenomena in the animal kingdom, proves that spermatozoa do respond to contact-stimulation. By suspending minute globules of vaseline in physiological salt solution, and adding to the latter active spermatozoa of the frog, he observed that they moved freely in all directions through the solution, but never through the thin drops of vaseline, moving around or away from them, as if studiously avoiding this kind of medium. This peculiar phenomenon can be explained only on the basis of contact-stimulation.

The Influence of Alcohol upon Proteid Metabolism.—That alcohol can be utilized by the organism like fats and carbohydrates, and can exercise the same proteid-sparing power as the latter, has been established by many observers, and is confirmed by the researches of R. ROSEMANN (Pflüger's Archiv, Vol. 94, Nos. 11 and 12). The latter shows, however, that under certain conditions, alcohol manifests regularly a proteid-destroying power. This is seen in cases not habituated to alcohol, but also in those accustomed to alcohol at the beginning of its administration, and also most probably in cases where the food has a low caloric value. At any rate, this unfavorable action of alcohol on proteid metabolism seems to be, in the majority of cases, a transient phenomenon, for its proteid-sparing power soon appears. This explains the erroneous conclusions drawn from the earlier investigations in this field; the experiments were of such short duration that they only revealed the first stages of the action of alcohol on the transformation of proteids, which in all cases were unfavorable.

Poikilothermism in Rabies.—It has for a long time been known, according to J. O. U. BARRATT (Jour. of Physiol., June 15, 1903), that in animals suffering from rabies, the body temperature, which is usually described as being slightly raised toward the end of the incubation period, subsequently becomes subnormal. Rabbits at the close of the disease are poikilothermic, the body becoming cold and the rectal temperature during the last twenty-four hours of life being within a few degrees of the room temperature. This phenomenon is to be attributed to a paralysis of the heat-regulating mechanism. During this stage the respiration-rate and the heart-rate are retarded.

Meat Diet and its Relation to Gout.—A careful review of the experiments of the earlier investigators in this field, precedes the description of the researches and results of M. KOCHMANN (Pflüger's Archiv, Vol. 94, Nos. 11 and 12). Pflüger showed in 1900 that an exclusive diet of horse-flesh produced in dogs severe diarrhea. He succeeded in isolating, to a certain extent, the constituent producing this deleterious effect; he found it present in the broth of the meat, could not precipitate it by means of alcohol, but could obtain an ethereal extract. At this time Kionka showed that he could produce a genuine arthritis urica in hens by an exclusive diet of meat lasting for five months. Others before this had produced gout in birds in various ways: Ebstein, by the injection of chromic acid; v. Kossa, by the administration of oxalic acid, phenol, etc. The microscopic changes in the organs of hens made gouty by methods such as those of Kionka, were studied by Bannes, with the following findings: retention of urates in the liver, kidneys, spleen and serous membranes; degenerative processes in the liver, kidneys and spleen; necroses and cloudy swellings of the epithelia of the larger parenchymatous organs; and finally that there is microscopically a difference between gout induced by renal poisons, such as chromic acid, and that induced by an exclusive meat diet. The above results inspired the author to investigate the problem as to whether any pathological changes could be found in mammals after an exclusive diet on meat. The animals experimented on were dogs. Three of these animals after being fed for forty days on meat alone, were killed by opening the carotids and immediately subjected to autopsy. They all showed fatty degeneration of the kidneys and liver, differing qualitatively in each case. The clinical history of these animals was as follows: As regards weight, all three presented marked changes, sometimes increasing, sometimes diminishing, but the end-weight being not very different from the initial-weight. The general condition was always good. The urine sooner or later contained albumin. Although no casts were found, the state of the urine indicated a nephritis. The animals were markedly constipated. The autopsy revealed in all the cases an acute or a subacute nephritis, a cloudy swelling of the liver-parenchyma, and a pigment deposit in the spleen. The author maintains that although he was not able to produce gout in dogs, as Kionka had in hens, yet his results show some analogy to the clinical and pathological manifestations of human gout, and that he has proved a direct relationship between an absolute or almost absolute meat-diet and the etiology of gout. He alludes, in this connection, to the frequency of gout among the beef-eating Englishmen, to the increased elimination of uric acid following a superabundant meat diet, and to the fact that only a part of the uric acid is eliminated through the kidneys. The greater part is destroyed, and according to Wiener, in different animals is destroyed in different parts of the body. In the dog and perhaps also in man, a part of the uric acid is broken up in the liver; in the cow, a portion is destroyed in the kidneys, and in all mammals the muscles take an important part in its destruction. Any degeneration, therefore, of the liver and kidneys would interfere with the destruction of uric acid. Moreover, lack of exercise would impair muscular activity in this direction. The diseased kidneys would at the same time be unable to do their share in the excretion of uric acid, with the result that this substance, accumulating in the body in certain localities, would give rise to the pathological and clinical picture of gout. A further support to this hypothesis is seen in the fact that the uric acid arthritis develops gradually, that degenerations of the liver and kidneys are found in many cases of gout, and that all those influences that would cause degeneration of the kidneys, liver and muscles would favor the appearance of gout. Of these influences may be mentioned a meat diet, either exclusive, or nearly so, chronic alcoholic poisoning, and chronic metal-intoxication, particularly that of lead.

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A WEEKLY JOURNAL

OF MEDICAL SCIENCE.

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THE LATEST WORK IN YELLOW FEVER.

IT should surely be a source of national pride, when we view the fact, that all of the important discoveries concerning the cause and propagation of yellow fever have been the contributions of American scientists.

Sternberg's initial work upon the cause of this disease first showed that it was not due to a bacterial or vegetable parasite, and his experiments thus cleared the field for subsequent investigations.

The next milestone was reached when Surgeon Carter of the Marine Hospital Service distinctly showed that the disease was not contagious by personal contact, but that the spread of the epidemic depended on "place infection." He also brought forward the distinction between the intrinsic and extrinsic periods of incubation of the disease, which paved the way for the mosquito work of Finlay, Carroll, Reed and Agramonte.

The fact that the mosquito (*Stegomyia fasciata*) transmits the infection of yellow fever is a most valuable addition to our knowledge of the disease from a practical standpoint. It has made the suppression of epidemics a comparatively easy task, and has placed land and maritime quarantine measures upon a practical basis.

The report of Working Party No. 1 of the Yellow Fever Institute of the United States Public Health and Marine Hospital Service, about to be issued, now advances the subject one step higher by clearly showing the phases of development of the parasite causing yellow fever within the body of the intermediate host, *i.e.*, the *Stegomyia fasciata.*

The Working Party consisted of Doctors Parker, Beyer and Pothier, who spent the summer at Vera Cruz, where the prevalence of the disease gave them abundant opportunity for study and painstaking research. They demonstrate, with the utmost clearness, the various phases in the cycle of development of the parasite, from the stomach of the mosquito—which has bitten yellow fever patients—to the salivary gland.

Both the Yellow Fever Institute and the Working Party are to be commended upon the fact that they do *not* claim that the parasite in the *Stegomyia fasciata* is the cause of yellow fever; although from its relation to the disease, and from the fact that the parasite cannot be found in mosquitoes that have bitten other fever cases, the inference is very clear, that the cause of yellow fever in its sexual stage, has at last been discovered in the mosquito host.

The Yellow Fever Institute was founded in 1901, by Surgeon-General Walter Wyman, and its publications and results achieved have clearly justified the thought and work he has devoted to its organization and progress. The object at the Institute is to study yellow fever in all of its phases, until the menacing scourge is thoroughly understood in every detail.

The results of the labors of Doctors Parker, Beyer and Pothier must of course be corroborated, but we feel certain that since they have shown the way, others will have no trouble in attaining the same results. Those who have seen the slides and preparations of the mosquitoes that they have brought from Vera Cruz, are convinced of the importance and correctness of their findings. It now remains to find the parasite in the blood or tissues of human beings.

The conclusions of the Working Party, as given, are as follows: (1) That the bacteriological examinations of the blood of cases of yellow fever during life, and the blood and organs at autopsy, performed immediately after death, in uncomplicated cases, is negative; (2) that *Stegomyia fasciata*, when contaminated by feeding on a case of yellow fever, forty-one and a half hours after the onset of the disease, and subsequently fed on sugar and water for twenty-two days can

produce a severe attack of the disease in a non-immune individual. (3) That *Stegomyia fasciata* contaminated by feeding on a case of yellow fever, and after varying periods killed, sectioned, and appropriately stained, presents with regularity a protozoan parasite, the *Myxococcidium Stegomyiæ*, that can be traced through a cycle of development, from the gamete to the sporozoite. (4) That *Stegomyia fasciata* fed on blood from a case of malarial fever on normal blood, or artificially fed, does not harbor the parasite indicated in conclusion third.

These findings are not only very interesting, but are of the greatest importance in the elucidation of the true nature of the disease; and if they are corroborated by further examinations, and if the parasite is definitely located in the human body, we can feel that the problem of its etiology has been solved and that the epidemics in the future can be easily controlled.

WHAT IS GOUT?

"FROM Sydenham's day to our own—to penetrate no further into the past—we have not failed to talk about gout; how much more do we know of it than we did?" So writes Clifford Allbutt in a charming introductory essay to a discussion on gout in the July number of the *Practitioner*.

There is rich material in this number—T. B. Futcher writes on the "Occurrence of Gout in the United States;" Alexander Crombie, on "Gout in the Tropics," and T. S. Toogood on "Gout as it Occurs Among the Poor." Samuel West treats of the "Relation of Gout to Granular Kidneys and Lead Poisoning." Alexander Haig rides his uric acid theories in discussing the "Causation, Prevention and Treatment." J. Walker Hall writes on "Metabolism in Gout and the needs for combined investigation." "Treatment" is discussed by Sir Dyce Duckworth, Arthur P. Luff and Gilbert A. Bannatyne, while F. J. Poynton reviews the "Recent Literature of Arthritis" and comments thereon.

Futcher shows that for the United States gout is not a common disease, but nevertheless it is not as infrequent as many physicians have been led to suppose. Thus, taking Dr. Osler's words as a basis of comparison, he finds that in the last fourteen years—May 15, 1889, to May 15, 1903—there were 41 cases of gout out of a total of 15,697 admissions or an incidence of .26 per cent., whereas in St. Bartholomew's in London during the same time there were 124 cases admitted in a total of 33,356 admissions, or an average of 0.37 per cent., thus making only one-third more for London. Baltimore, nevertheless, Dr. Futcher writes, has probably more gout than almost any other large city. One of the reasons for the supposed comparative infrequency in the disease, says Dr. Futcher, is the failure on the part of the profession to recognize it. It is to be regretted that Dr. Futcher did not go outside of the Johns Hopkins Hospital for his statistics.

In the tropics Dr. Crombie thinks that the disease is much less frequent, particularly in India, and in other hot climates, than it is in Europe among the same class of patients. It is rarely met with in hospital practice in India.

Poverty being a relative term, Dr. Toogood writes, that it might be better for the gout-stricken subject if he were just the amount poorer necessary to prevent his acquisition of malt liquor. He doubts if the really poor ever develop gout; those with gout among the poor are poor because of their habits. From forty to fifty are the favorite years of incidence, although some patients are but thirty-five years of age when involved. Occupation does not seem to play any rôle, although unaccustomed walking often induces attacks. As to causation, he holds that the consumption of malt liquors is the chief if not the only cause of the production of gout. Wine and rich food are not known among the poor.

It cannot be said that Dr. West's contribution assists us in ascertaining the real relation of gout to lead poisoning.

Dr. Haig still assumes that gout is a uric acid disease, not a "diathesis," but a poisoning; in fact, he is so bound up in his theory as not to see many of the important recent lights shed upon the chemical metabolism of gout by other workers—notably from the continental laboratories. He still believes it a diet disease due to poisoning by flesh and tea. Dr. Toogood tells us the poor have gout from malt liquors and do not know what rich food is like.

Dr. Hall approaches the subject of metabolism in a more modern and, to us, enlightened manner. He takes up, in turn, the metabolism of the various foodstuffs in relation to the disease, devoting particular attention to the nucleins. He points out the futility of coming to conclusions from the work that has thus far been done on gout and suggests the formation of a joint commission to take up the various complicated factors. Isolated work is economic loss and thus far has led to erroneous and one-sided doctrines.

Writing on the subject of diet, Sir Dyce Duckworth says that he does not regard the disease as a purely humoral one but one of neurohumoral pathogeny. If it is necessary for observers to show uric acid poisoning in all cases he says "such pedants will have to wait long if they insist on this evidence."

He is of the opinion that many of the methods of handling gout are founded mainly on the treatment of the supposed causes of the disease and not for the treatment of the patient. Thus the patient is disregarded and everything is seen, as it were, through uric acid spectacles. He ridicules, and justly, we believe, the old saws about red meats being prohibited but that white meats, fish and game are allowed. Beef being condemned and mutton allowed, and a host of other imbecile suggestions that still hang on in fairly reputable text-books on dietetics.

With reference to animal food generally, he says it may be declared not only harmless but beneficial to gouty persons, if taken in moderation. As far as vegetables are concerned, he knows of no reason why any of them should not be taken. Potatoes are not harmful, nor any plant grown under the ground. Alcohol is of great importance he believes. A small amount of good wine once a day will not hurt gouty patients, but most of them drink too much. Malt liquors particularly do harm to this class of patients. The chief feature, however, is to disregard general rules and determine the proper line of diet for each individual patient. Treat him and let the theories go.

Dr. Luff believes in the auto-intoxication theory—"the poisons being possibly the purins and other bodies, but of which we, at the present, know very little"—he thus modestly and wisely puts it. He insists on the irrationality of a routine treatment and outlines the general mode of treatment in acute, chronic and irregular cases, following well-known formulæ and not contributing anything new to our recent text-book methods. He still believes in the use of alkaline salts "for the removal of gouty deposits" but goes back on the much-lauded "lithium" salts. He contributes some new ideas on the preventive treatment of gout, extolling the use of guaiac resins and quinic acid salts.

Dr. Bannatyne praises the uses of baths, and devotes much time to the details of technic. Dr. Poynton closes the discussion with a comment and review on the recent literature of arthritis.

We know of no better summary of our ignorance than in the Notes by the Way of the editor of the *Practitioner* itself: "(1) We do not know how the excess of uratic matter is brought about, whether it is due to increased intake with the food, to increased formation in the body, or to deficient elimination by the excretory organs. (2) We do not know whether the uratic excess is the cause of the phenomena of the disease, or is a mere casual accompaniment of the perverted state of nutrition. (3) Similarly, we do not know in the case of the arthritic attacks whether the deposit of urate of soda is the cause or the effect of the local inflammation."

In all probability gout consists in a defect of metabolism whereby products deprived from cell-nuclei are not properly used up or excreted. These products may arise either from nuclear matter contained in the food, or from the natural wear and tear of tissue-nuclei: they are retained in the system, and a deposit of one of them—sodium biurate—in the joints sets up irritation there, and causes an acute attack of arthritis.

We must not be blind to the fact that in using "that blessed word" metabolism, we mean no more than the chemical side of life itself. All diseases are disorders of metabolism—in other words, perverted vital activity. Hence we practically come back to our original starting point—that gout is a disease which we do not understand.

THE DANGER OF RAILWAY TRIPS TO HIGH ALTITUDES.

INDUSTRIAL progress creates new medical problems. Year by year the railways reach further and further into the wilderness and creep higher and higher to mountain peaks and valleys. Enterprising hotel managers, following in their sooty train, cap lofty summits with inn and lodge where formerly the lonely eagle perched unmolested. For the majority of people, this reaching out by man into Nature's distant quietudes is of great and distinct good. It takes him from the hum of his fellows to that rest which is essential to life.

But, while the majority of men profit, there is a very distinct, and a large and increasing class to the existence of which attention has, as yet, scarce been called, to whom in these mountain resorts there lurks the Angel of Death.

This is the season, when, from Maine to California practitioners are being called upon for advice as to the choice of regions in which to rest and recuperate from the winter's wrenching vor-

tex of dissipation and of work. The NEWS believes it opportune to urge the possible danger of high mountain travel to all save the healthy and the young.

Physicians who are apt to be called upon to give advice in this matter, cannot do better than to read an article in the *Lancet*, June 20, 1903, by Theodore Zangger, late assistant physician, University Hospital, Zurich, Switzerland. He has, for a number of years, been in the position to observe the effect both of active and passive (railway) mountain climbing in the Alps. He concludes that it is a menace to the lives of elderly persons to ascend beyond 3,300 feet above sea level. Cardiac thrombosis and pulmonic embolism are the accidents to be feared. The seizures do not by any means always take place during the stay on high ground but often come on slowly or abruptly, one, two, or even three days after descent.

There are in this country, as compared with Switzerland, relatively few mountains which are clambered by railways to dangerous altitudes. The roads up Pike's Peak, Mount Washington and the Santa Fé, in New Mexico, as well as some of the transcontinental lines, both here and in British Columbia are exceptions. Outside of these there are, however, a number quite worthy of consideration.

Zangger considers that while under certain conditions 3,300 feet of ascent calls for precaution—in the case of patients with even slight arteriosclerosis the mountain railways up to 7,000 or 10,000 feet are positively dangerous. At this last level there is registered a fall of 200 millimeters in the mercurial barometer. This rarefaction of the air produces an increasing congestion of the pulmonary capillaries which is abetted by the sudden changes of temperature encountered at altitudes. Even when at rest, there is an increase of about 40 per cent. of the respiration volume as compared with the corresponding volume for the same person when on low ground. This in itself is a difficult proposition in the face of any emphysema whatsoever, and is easily seen to imply a marked increase in the work of the right heart. Many persons between fifty-five and seventy years of age consider themselves hale and hearty and are yet the subjects of advanced arteriosclerosis, emphysema and perhaps of cardio-renal involvement.

It may be useful to practitioners to be reminded that in Switzerland alone there are no less than nine railways which creep to an altitude of between 6,000 and 10,000 feet. Who has not heard of the Rigi Culm, 5,900 feet, of the Schynige Platte, 6,660 feet, of Scheideck, 6,470 feet, of Pilatus, 7,000 feet! These are, however all dwarfed into insignificance before the famous line which is being bored through the heart of the Jungfrau. This has, in the past ten days, reached its fourth station, which is at the 10,000-foot plane. It is probable that many American tourists will be unable to resist the delights of this unique journey.

So prominent had these problems become ten years ago that the Swiss Government actually refused to grant a franchise to Gnyer-Zeller to build the road in the Jungfrau until scientists had fully considered the question of its relation to the public health. The well-known physiologist, Kronecker, of Berne, became a member of the committee, and its report (1890) was to the effect that it was not desirable to grant the franchise until the company had proved that such ascents could be made without detriment to health. Whereupon Gnyer-Zeller immediately arranged, with the aid of forty-two guides, to carry seven people in chairs to the summit of the Breithorn. Kronecker and Sahli, of Berne, made observations on these subjects. Their conclusions were as follows: "Healthy people do not suffer from being conveyed without any exertion on their part to an altitude of some 12,000 feet, but as soon as any, even slight, muscular action is required of them, distressing, or even dangerous symptoms of circulatory trouble supervene." "Reduction of barometric pressure causes dilatation of the right ventricle." So important did the public health considerations seem to Kronecker that he made the following recommendation: "That a physician should be stationed at Scheideck (6,470 feet), who would examine any passengers, at their wish and expense, in order to dissuade them from the trip up the Jungfrau, should they be suffering from any serious affection of the heart or respiratory organs."

It will thus be seen that we have much to learn from the Swiss as to the choice of mountain resorts for a certain distinct class of people. As the honeycombing of mountains and the placing of inns at great altitudes grows more common, the general public, always eager for novelty, will rush to visit them. The course of the profession is clear. Only those travelers who can pass a rigorous cardiovascular examination should be allowed to undertake these delightful but dangerous mountain climbs.

ECHOES AND NEWS.

NEW YORK.

New Health Regulations for Infants.—The Department of Health has recently issued a circular on how to keep the baby well. The text is here given:

1. *Nurse it:* Nothing equals mother's milk for a baby food. If you cannot nurse the baby use *fresh milk,* which in hot weather has *been boiled* and prepared according to directions. (A circular of directions will be sent on application to the Department of Health). Nurse the baby part of the time, if you cannot nurse it all the time. Do not give it condensed milk or any prepared babies' food.

2. *Feed or nurse it at regular intervals,* not more than once in three hours after it is six weeks old. Don't feed it simply because it cries. Decrease the amount of milk on very hot days. Too much food and too frequent feeding are among the commonest causes of sickness.

3. *Bathe it daily:* The glands of the skin carry off nearly as much poisonous matter as the bowels. They both must be kept open in hot weather. Dry the skin well after bathing.

4. *Air it:* Out-of-door air is necessary. Keep the head shaded from the direct sunlight. In hot weather take the baby out early in the morning before 9 o'clock, when it is cool, and again late in the afternoon and *early* evening, but not late at night.

5. *Keep it cool:* If it is bundled up too much in summer it will become overheated. The more nearly naked it is, the better in extremely hot weather.

6. *Keep it in a quiet place:* A baby's nerves are very sensitive. Continued noise sometimes causes sickness.

7. *Give it water:* Between feedings give water freely, especially in hot weather. Use only water that has been boiled.

8. *Give no fruit* to a baby less than a year old. In summer give no fruit to a baby less than two years old. Fruit kills many babies.

9. *Give no solid food* to a baby less than one year old. For the first year of life the food should be *all milk.* For the second year, *chiefly milk.*

10. Call your own doctor, or if you have none, in summer notify at once the Department of Health if the baby has diarrhea, or is sick, and a doctor will be sent immediately.

11. *When the baby has diarrhea* stop all food and give only barley water until the doctor comes.

12. Use bottled or certified milk; Straus milk, or that prepared and furnished at the various dispensaries (not grocery milk), if you cannot nurse the baby.

Medal for 20 Years' Hospital Service.—John S. Langton, orderly and nurse at the Hudson Street Hospital, this city, received recently a gold medal from the Board of Governors and Surgeons of the New York Hospital, of which the Hudson Street Hospital is a branch, as a token of appreciation of twenty years' service.

Work of the Lying-in Hospital.—In the month of June the new lying-in hospital at Seventeenth street and Second avenue, this city, has had 434 applicants for treatment, of whom 119 were admitted and cared for in the hospital wards. The number of children born in the hospital during June was 90. For the same period in the outdoor department 266 have applied for assistance in their own homes, and 227 patients were treated in confinement. The number of medical visits made was 925.

New Harlem Hospital.—Dr. John W. Brannan, president of the board of trustees of Bellevue and allied hospitals, opened bids last week for the new Harlem Hospital in Lenox avenue, between One Hundred and Thirty-sixth and One Hundred and Thirty-seventh streets. The Board of Estimate appropriated $275,000 for the hospital building proper and $125,000 for the powerhouse and outlying buildings. The lowest bid for the erection of the hospital proper was $367,385, from James McFerran. The Board of Estimate will consider the bids and either reject them all on the ground that they are too high, or make the entire appropriation available for the hospital proper. The new hospital is to be of brick, trimmed with granite, with four-story wings and a five-story administration building.

New Medical Directory.—The Medical Directory of the City of New York for the current year has just been issued by the County Medical Society. It gives lists of all physicians in the States of New York, New Jersey, and Connecticut, lists of pharmacies, hospitals, benevolent societies, homes, asylums, and various other data of value.

Statement by the Mayor of Ithaca.—The mayor of Ithaca writes to the *Sun:* "Anent the report which appeared in your issue of Thursday, July 16, I would state for the information of the public: First, that the epidemic of last January was over months ago. Secondly, that the 'Ithaca Water Board' organized in April with authority to expend $750,000 for a supply of pure water, is sinking wells to veins at least 280 feet in depth, and more are projected. Thirdly, that wells now flowing aggregate 640,000 gallons per day; an amount which will be greatly increased when pumps are attached. Fourthly, that with a Board of Health of more than usual efficiency, composed of our best citizens, with artesian water largely used for drinking and cooking purposes, together with the fact that no expense has been spared to make this city the cleanest in the United States, gives me warrant for saying no city can be safer as a place of residence or to visit than is Ithaca at this time."

Man Dies of Glanders.—James M. Cahill, a fish dealer of Unionport, Westchester, died in the Presbyterian Hospital last Wednesday of glanders. The doctors at that institution say it is the first case that they have ever had.

As to Insane Criminals.—An important decision was handed down this week by Justice Lambert of the Supreme Court, Brooklyn, in relation to the incarceration of the criminally insane. The case was on the application of Alexander Gray for his discharge from the Matteawan Asylum. The writ to test the constitutionality of Section 454 of the Code of Civil Procedure, which provides that when the defendant charged with a crime is acquitted by a jury on the ground of insanity the trial court may, if it deem it best for public safety and peace, commit the acquitted defendant to the State asylum until he is discharged as cured. Gray was tried in the Court of General Sessions in New York County for assault in 1901, and acquitted by that jury on the ground of insanity, and the court sent him to Matteawan. Counsel for Gray claimed that the Court of General Sessions had no authority to pass upon the question of Gray's alleged insanity, and that exclusive jurisdiction in such cases is vested in the Supreme Court. Justice Lambert says: "The writ so far as is raised and presented the questions: First, that the Supreme Court has exclusive jurisdiction of insane criminals. The commitment is authority for the detention of the relator only during the period of his insanity. If he has recovered, he is entitled to a discharge."

PHILADELPHIA.

Health of the City.—During the past week there was a decided falling off in the number of cases of contagious diseases. This was especially true of smallpox, there being but 24 new cases as compared with 54 for the previous week. On the other hand, there were more deaths of infants than during any

previous week of the summer. The deaths numbered 130, of which 109 were ascribed to cholera infantum and 21 to marasmus.

New Hospital Dedicated at Chester.—The J. Lewis Crozer Hospital at Chester was dedicated on July 17. This hospital is an H-shaped building, 161 feet in extreme length with two wings each 91 feet in length. It contains all the modern improvements of hospitals, including X-ray apparatus and well-equipped pathological and bacteriological laboratories. The surgical operating section is a suite of five rooms.

Hospital Roof Garden Opened.—The new roof garden for consumptives at the Philadelphia Hospital was formally opened on July 14 in presence of Mayor Weaver, Director Martin, and many members of the hospital staff. The roof garden is 200 feet long and 30 feet wide. Room will be furnished for from 80 to 100 cots.

State Board of Health.—The fifty-fifth meeting of the Pennsylvania State Board of Health was held at Marietta on July 16. Action was taken regarding the pollution of the Schuylkill and other rivers. Reports showed that during the months of May and June there were in the State 1,092 cases of smallpox, with 66 deaths. The Committee on Poisons and Explosives was instructed to prepare the draft of an act to prevent the use of toy pistols by minors. This action was taken because of the many fatal results from the use of those instruments on the Fourth of July.

Gift for Philadelphia Medico-Chirurgical College.—By the will of Spencer Morris, formerly professor of medical jurisprudence and toxicology at the Medico-Chirurgical College in Philadelphia, $12,250 is bequeathed to that institution, the income of which is to be awarded annually to the member of the graduating class who receives the highest general average at the final examination for the degree of Doctor of Medicine.

CHICAGO.

New Medical Dictionary.—Dr. Karl von Klein, of this city, is compiling a medical dictionary which will include all medical terms in every language.

Changes in Illinois Medical College.—Dr. J. F. Presnell, late surgeon U. S. Volunteers, and Dr. Frank Byrnes, have been elected junior professors of surgery. Dr. Wm. F. Waugh has severed his connection with the college. The new buildings have been completed, one of which is devoted to anatomical laboratories, and the other is to be used as a training school for nurses.

GENERAL.

New Army Medical Journal.—*The Journal of the Royal Army Medical Corps* is the name of a new journal, devoted to medical matters of interest to the British Army. The establishment of this journal has been in contemplation since 1864.

Appointment of Dr. Eycleshymer.—The University of St. Louis, which recently purchased the Marion Sims-Beaumont College of Medicine, has appointed Dr. Albert C. Eycleshymer, assistant professor of anatomy in the University of Chicago, as director of its Anatomical Department.

Educational Bequests.—The late Mrs. Harriet Lane Johnston, of Washington, has bequeathed $60,000 to the Johns Hopkins University for the establishment of three scholarships. She has also bequeathed $300,000 for the establishment of an Episcopal school at Washington for the maintenance, education and training of choir boys.

Dr. Albert Appointed.—Dr. Henry Albert has been elected assistant professor of pathology and bacteriology in the College of Medicine in the University of Iowa.

"The Law and the Doctor."—Amid the multiplicity of his daily duties, the physician has but scant time to cultivate more than a passing acquaintance with the collateral branches of his profession; the average practitioner, therefore, knows but little of the legal aspect of his relations to the body politic, or his rights and privileges, or his liabilities and responsibilities to his patients and the community at large. While pursuing "the even tenor" of his professional way, the doctor may suddenly be confronted with a summons and complaint in an action for malpractice, or may be called as an expert witness in a similar suit against a colleague. It is not the intention to urge the physician to become his own lawyer, but he should certainly acquaint himself with the fundamental principles of medical jurisprudence, so that he may be reasonably well prepared to defend his own or his brother physician's rights and privileges on the witness stand. With a view of placing such information at the immediate disposal of the doctor, the Arlington Chemical Co. has arranged to issue under the title "The Law and the Doctor," two 48-page booklets which shall present in condensed form and succinct style, an epitome of the essentially important features of (1) "The Civil Liability of the Physician for Malpractice" and (2) "The Physician as a Witness." These exceedingly practical monographs have been expressly prepared by an eminent member of the New York Bar, who is well recognized by the legal profession as an expert in this special branch of practice. The first of these reference text manuals is now ready for distribution, and after a reasonable interval will be followed by the second monograph. Copies may be had by applying to the above company.

Yellow Fever Dies Out in Havana.—Dr. Barnet, the Acting Chief of the Sanitary Department, announces that only three cases of yellow fever have entered Havana harbor this year. Of the three fever-stricken persons, all of whom came from Mexican ports, one died and another was discharged last week as cured. The remaining patient now here came to Havana from Progreso by representing himself as a passenger who had previously registered as an immune. The Government's surgeon at Progreso, Dr. Pla, has been recalled to Havana and probably will be dismissed for relying on a passenger's sworn statement without investigating.

Sanitation in Manila.—Surgeon-General O'Reilly has received an interesting report from the medical officers in the Philippines which shows a steady decrease in the death rate of the city of Manila as a result of the operations of the medical officers of the army. The death rate of Manila for the first quarter of the last four years has decreased steadily from 46.80 per thousand of the population for the first quarter of 1900 to 22.17 for the first quarter of 1903. Assistant Surgeon Munson says that the improvement in the conditions this year has been accomplished in spite of the fact that Asiatic cholera and bubonic plague had previously gained a foothold in the islands and that the existence of a largely unvaccinated population in the provinces meant a constant introduction into the city of the infection of smallpox. Cases of plague, cholera, and smallpox have occurred in Manila during the present year, but the precautions taken by the Board of Health have prevented an epidemic therefrom. "The sani-

tary results obtained in the last four years through American control have been accomplished," says Dr. Munson, "despite the naturally insalubrious location of Manila and its total lack of sanitation under the former sovereignty, which from the level site interfering with drainage, the many foul canals ramifying the city, the absence of any sewerage system, and the existence of an impure and insufficient water supply, and many old unhealthful habitations—have created sanitary problems of the greatest difficulty. The Board of Health therefore has been unable to turn previously existing methods and conditions to sanitary advantage, and has found it necessary not only to develop entirely new plans of improvement, but at the same time to combat the results of conditions inherited from the Spanish administration. The mixed character of the inhabitants with their prejudices, superstitions and largely primitive habits of life, also has been a constant obstacle in sanitary work."

Autopsy of the Pope.—Dr. Giuseppe Lapponi on July 22 presented to Cardinal Oreglia, Dean of the Sacred College, the official report of the autopsy performed yesterday on the body of Leo XIII. The report is chiefly important as disproving the presence of cancer or nephritis. The text of the report follows:

Yesterday evening, from 4 to 8, the embalming of the body of His Holiness, Leo XIII, took place. We began by injecting into the thigh over five litres of special preserving liquid. Having opened the abdomen, the lower viscera were extracted and were found to be perfectly healthy. The spleen and kidneys were also absolutely normal. In the latter the cortical substance was well preserved and of a pale pink color. After opening the thorax it was found that the heart, the aorta, and the carotid arteries were healthy except that in the arch of the aorta was found an atheromatous excrescence. Nothing unusual was found in the pericardium. The pleura on the left side was quite normal, but on the right side the pleura was full of liquid of an orange yellow color above and bloody at the bottom, with a large clot of fibrin floating. More fibrin was on the free surface of the pleura toward the ribs, with a slight scraping of fibrin easily detached, allowing a view of the serous surface. The upper part of the right lung was quite normal, but the lower part was somewhat hard and cracked at the touch, and while cutting a whitish, frothy liquid oozed out. The inferior lobe had partly adhered to the wall of the thorax, and when this was cut a dirty, white, abundant liquid, without gas, oozed out, showing complete hepatization. Afterward the thorax was filled with medicated cotton and an antiseptic absorbing substance, after which the incision made for the examination was sewn up and the body put in order.

Obituary.—Dr. Isaac N. Beegle died Monday in Ocean Grove, N. J., where he had practised as a physician since 1881. He was born in Bordentown, N. J., and was 56 years old.

Vesical Infection with Coli Bacillus.—An unusual complication following surgical intervention is reported by TOLÉDANO (Jour. de Méd. de Paris, June 14, 1903). Following a successful operation for recurring appendicitis, the patient developed, after forty-eight hours of satisfactory progress, fever, dyspnea and retention of urine, the specimen withdrawn by catheter being fetid and of abnormal appearance. Examination of the lungs revealed a congested condition of both organs and examination of the urine showed numerous bacteria, which proved to be coli.

CORRESPONDENCE.

OUR VIENNA LETTER.

(From Our Special Correspondent.)

VIENNA, Austria, July 11.

THE NEW VIENNA CHILDREN'S HOSPITAL.

Up to a short time ago Vienna was very insufficiently supplied with children's hospitals. In the year 1900 in all the children's hospitals of Vienna there were only 521 beds, so that, considering the number of Vienna's inhabitants, the proportion is one bed to every 3,107 inhabitants. In Budapest the proportion is 1 to 2,057. It is to be remarked that the better part of the existing hospitals are not at all up to the requirements of modern sanitary conditions, and they are situated at places where the surroundings are everything but favorable.

The new hospital is named the Kaiser Franz Josef Regierungs-Jubiläums-Kinderspital. The hospital owes its existence to the two million crowns fund of the City of Vienna, given in honor of the occasion of the 50-year jubilee of the Kaiser, and to the bequest of George Nellermann, consisting of 600,000 crowns. The government accepted this donation with the condition that it erect a hospital able to accommodate between 180 to 200 patients. The building was finished on August 18, 1902, the birthday of the Emperor Francis Joseph. The new hospital consists of three buildings of the already existing Wilhelminen Hospital, together with 34 pavilions, which can be grouped as follows: (a) Administration buildings; (b) Internal and Surgical Section, with 86 beds, in five buildings; (c) the infected section, with 106 beds, in 23 buildings.

One of the characteristics of the new hospital was to spare neither money nor land in order to apply the most modern achievements of medical science.

The buildings are of five kinds: those with 43, 17, 11, 5 and 2 beds; the latter are the so-called observatory wards for mixed infections or for patients whose diagnosis is not yet established. There are lofty, wide balconies built at the south side of the pavilions, whereon patients can lie in favorable weather.

In every pavilion, besides a tea kitchen, we find a lavatory, baths, closet, and also a complete laboratory, and a so-called prescription room, wherein more accurate examinations, minor operations, etc., can take place.

These pavilions are heated with steam and illuminated by gas and electric lights.

The cost of maintenance per patient is about $1.20.

The Internal Medicine section is under the supervision of Dr. Folsenek, that of surgery under Dr. Friedländer. The surgical compartment is connected with the operating theater through a roofed corridor. The orthopedic gymnasjum is also connected with the surgical compartment, and is under the direct supervision of Dr. Lorenz. The nurses at this hospital either belong to or are under the jurisdiction of the sisterhood of the St. Vincent order.

The hospital is under the jurisdiction of a large and competent staff, with Surgeon-in-Chief Pospischil at its head.

SOCIETY PROCEEDINGS.

NORTH BRANCH OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, held April 13, 1903.

The President, H. Brooker Mills, M.D., in the Chair.

SYMPOSIUM ON TYPHOID FEVER.

The Diagnosis of Typhoid Fever With Some of the More Frequent Complications.—This is the title of Dr. William Egbert Robertson's paper, in which he

called attention to the fact that there was no one symptom which could be relied upon for an absolute diagnosis in these cases, making it necessary to group together a number of symptoms upon which to base an opinion, the time and sequence of their appearance also being considered. Whenever possible, both clinical and laboratory observations should be employed. He believed that if the thermometer were more frequently used in office practice there would be fewer cases of the ambulatory type, as often a slight rise in temperature would put the physician upon his guard sufficiently to suggest rest in bed and other remedial measures at the time he is first consulted. A case was reported of a patient who had visited his physician, complaining of lassitude and inability to concentrate his mind upon his work, at intervals during three weeks, at the end of which time his temperature was taken, and found to be 103° F. He was immediately ordered to bed, but the case terminated fatally in a few days from hemorrhage of the bowels. The second case reported was that of a man who was admitted to the Episcopal Hospital, stating that he had not been well for a month, but continued to work the entire time. While at his bench, he was suddenly taken with cramp-like abdominal pain and immediately sent to the hospital where a diagnosis of perforation was made and an operation being performed was followed by recovery. Reference was made to the fact that, although we know the specific etiological factor that causes typhoid fever, diagnosis by this method is not always possible, even to the laboratory man, and the methods are not usually available to the general practitioner. The antecedent history of the patient, the mode of onset, temperature curve, relation of pulse and temperature, and the presence or absence of spots, are of material aid, but even considering all these symptoms a positive diagnosis is often impossible for several days. Frequently, however, the patient will complain of tiring readily for a few days prior to the attack, pains and aches throughout the body, loss of appetite, coated tongue, possibly slight looseness of the bowels, headache and epistaxis, and while a fictitious diagnostic value should not be placed upon these symptoms, their presence is sufficient in many cases to excite suspicion. The temperature was thought to be the most important early symptom and a careful record thereof during the entire course of the disease was recommended, semi-daily observations being made and recorded by some member of the family, if a trained nurse is not in attendance, careful observation usually revealing the fact that it rises from one to two degrees higher each day than the preceding. Another symptom that should always be considered is the pulse temperature ratio, as cases are frequently observed in which the temperature is as high as 103° F., while the pulse may not be more than 100 to 110, or, in rare instances, as low as 90 or less, and when repeated examinations show a daily increase in temperature without a corresponding increase in the pulse rate, especially when dicrotism is superadded, we have a most valuable symptom. While cases of meningitis often present similar conditions late in the course of the attack, the pulse becomes very rapid. This symptom is enlargement of the spleen which frequently can be discovered on palpation, as early as the end of the first week, and percussion over this region, as well as over the right iliac region will often elicit considerable tenderness. The next symptom is the appearance of the rose spots, which usually occur about the tenth day and last three or four days, upon which too much diagnostic importance should not be placed as they are absent in about 25 per cent. of the cases, and some other conditions present similar spots. Three classes of typical cases were mentioned as presenting more than usual difficulty: (1) The extremely mild cases, in which the duration of the attack is about as usual, but in which only moderate fever exists and the few symptoms arising are trifling in character. The second group are the abortive cases, which often begin rather abruptly and frequently with high fever and very pronounced symptoms for the first two or three weeks, and then go on to recovery. The third class are the ambulatory cases, which at first glance seem to belong to the first group, but were these cases diagnosed and put to bed early in the course of the attack probably fewer fatalities would occur. Rarely, according to Gerhard and Lichermeister especially, afrebile cases may be met with. The author stated that he had seen one which he had placed in that category. The patient had moderate fever, 100½° F., for forty-eight hours, after which it fell to normal and subnormal. Aside from temperature and temperature and pulse ratio these cases run a very benign course. Two types of the disease, both of which are abrupt in their onset, and of which very little mention is made in text-books, are the bilious and the respiratory, the former commences with bilious vomiting and the latter with bronchitis. While these cases are sometimes preceded by chills, they are not so much as formerly, when the antipyretics were more frequently administered for afrebile cases. Age, too, modifies the disease. The Widal reaction can rarely be obtained before the eighth day and, while of value in conjunction with other symptoms, it is not as important as the discoverer claimed. He then went on to say that complications were probably more numerous in this disease than in any other infection, and without mentioning them all he laid especial stress upon hemorrhage and peritonitis, preferring to use the term peritonitis, as other causes than perforation of the bowel not infrequently give rise to it. Speaking of hemorrhage, he said it occurred in about five per cent. of all cases and in from 10 to 20 per cent. of all fatal cases. It varies in amount from a mere trace to copious quantities, and from 1 to 15 or even 20 successive bleedings. A single copious hemorrhage may take place and death ensue, without any external exudence of bleeding. No clinical evidence of the smaller bleedings are elicited. Moderate hemorrhages are sometimes, seemingly at least, accompanied by more or less improvement; large hemorrhages always give rise to more or less collapse. In the great majority of cases pain immediately precedes the accident. Fall in temperature and increase in pulse-rate is also observed. Tenderness, localized or diffuse, more or less meteorism, and if the bleeding has been large, anemia, pinched features, cold extremities and sweating frequently supervene. Occasional rise of temperature, with or without the preceding chill may herald the hemorrhage.

Perforation.—Perforation occurs in about two per cent. of all cases, and from 20 per cent. to 30 per cent. of all fatal cases. Peritonitis, therefore, from all causes combined, is the cause of death in about one-third of all fatal cases. Recovery may ensue without operation, as clinical and post-mortem evidences demonstrate, but this seems to be rare, and surgical interference offers the only hope in the majority of cases and must be early to be of any use. Therefore, most minute and painstaking observation is necessary in every case of typhoid. Perforation is almost invariably preceded by bleeding for some hours, and immediately preceded by more or less pain, local or diffuse, and tenderness. Spasm and meteorism rapidly supervene. The absence of meteorism speaks for some other cause than perforation of the bowel; hence careful percussion, especially if the border of liver dulness is indicated. If one waits for indubitable signs of peritonitis, it is too late. Under cocaine an exploratory incision can be made with

impunity, and should never be omitted, where the case justifies the least suspicion. Clinical observation, he insisted, is probably of greater importance than laboratory aid in these cases; at least in the light of our present knowledge, but wherever possible, leucocyte counts, and, in cases of suspected hemorrhage, hemoglobin counts should be made.

Mild Symptoms Masking Perforation With Peritonitis—Death.—This was the title of a paper read by Dr. A. B. Hirsh, in which he directed attention to the large number of fatalities occurring in this class of cases, and felt that in view of the obscurity of the cases and the fact that celiotomy, when performed early, saves many patients, all cases of this character should be put on record. He then went on to report the case of a man, aged twenty-seven years, iron-riveter by occupation, of muscular physique, giving a negative family and personal history; he reported having had the appendix removed two years previously for a primary attack of appendicitis. Deafness consequent upon his employment, was added to the mental hebetude usually found in cases of typhoid and increased the difficulty of obtaining subjective symptoms. For two weeks prior to the time he came under observation, he had been suffering from increasing debility, fever, headache, some nose bleeding and nocturnal dreaming, but not vomiting or diarrhea. His temperature was 101.5° F., pulse 90, both of which continued practically unchanged throughout the progress of the disease; apathy was marked; the features were drawn and some emaciation was evident; a few rose spots were found; the abdomen was flat with absence of tympany, gurgling and localized or general tenderness; the liver and spleen were enlarged; constipation was present, necessitating the use of suppositories and enemata; the urine was normal, though diminished in quantity. The Widal reaction was positive. His progress during the first week proved uneventful. Icebag applications and alcohol rubbings were the only drugs administered for the fever, and trional or bromides for sleeplessness. On the seventh day there was a rise in the temperature to 103° F., but this was reduced by the application of the icebag and did not again return. On the morning of the tenth day tenderness in the left inguinal region was first noted, the area of gastric dulness was increasing, and this was followed by rapidly growing and general abdominal tympany; afterward the pulse became small, tense and wiry and very rapid and could scarcely be counted. Although the mental condition was unchanged, there was evidently failure of the vital powers, which forbade operative procedure, which was indicated by the undoubted peritonitis, and death ensued the next morning.

An autopsy upon the above described case was made six hours after death by Dr. H. C. Carpenter, who presented the following report: Body of white man, apparently about thirty years of age; extremely emaciated. Two scars are visible in the right inguinal region, each about two inches in length, one running along the outer edge of the right rectus muscle, with its center about McBurney's point; the other scar is over Poupart's ligament and running parallel with it. On making the incision the abdominal walls are very thin and when the peritoneum is opened a large quantity of gas with a decidedly offensive odor escaped. The pericardium contains slightly more fluid than normal. The heart is normal in size; the left ventricle is contracted; there are no clots, the valves are normal and the heart muscle is in good condition. The lungs are entirely negative; no stasis present. The kidneys are large; the capsule non-adherent and shows a moderate degree of parenchymatous nephritis. When the abdominal contents are exposed, an intense suppurative peritonitis is seen. The omentum covering the viscera extends down into the pelvic cavity where it is bound down by adhesions. That portion of the omentum which occupied the left side of the pelvis was gangrenous. The intestines were matted together with many pockets of pus lying between the coils. The pelvic cavity is full of liquid feces and pus. The last two feet of the ilium is covered with a fibrino-purulent deposit and is very dark in color. A perforation of the ilium is seen, about six inches from the iliocecal valve, the size of a pea, this is at the bottom of an ulcer three-quarters of an inch in diameter. The contents of the ilium are chocolate-covered liquid feces. Very few ulcers are present except in the last foot of the ilium; no ulcers are seen in the colon; the gall-bladder is distended with bile, but there are no gall-stones. The stump of the appendix which remains is not affected. The stomach is greatly distended and firmly adherent to the spleen and surrounding organs. The contents are a dark-brown liquid. No gastritis present. Spleen is moderately enlarged, soft and flabby.

Treatment of Typhoid Fever Complicated With Indicanuria.—This paper was read by Dr. Judson Daland, in which he stated that, while he formerly employed the Jaffey test for indican in the urine, he had lately modified his technic in accordance with an article published by Casimir Strzyzowoski, in the *Oesterreichische Chemiker-Zeitung*, for October 15, 1901, in which he gave the following method: "To 20 c.c. of urine of specific gravity of 1.015 (or greater) add 10 c.c. of a 10-per-cent. solution of neutral lead acetate. If specific gravity is less than 1.015, only take 5 c.c. of lead acetate solution and 5 c.c. of water. Filter through a dry filter and take 15 c.c. of a clear filtrate which corresponds to 10 c.c. of the original urine; add one drop of a one-per-cent potassium chlorate solution, then 5 c.c. of chloroform, and lastly 15 c.c. of pure fuming hydrochloric acid (specific gravity 1.19). Mix thoroughly by pouring repeatedly from one test tube into another. In ten minutes the maximum coloration has been reached, and the chloroform will be colored more or less blue according to the amount of indigo set free. Should the chloroform be colored violet by iodine add two drops of a five-per-cent. solution of thiosulphate."

This test, by the substitution of potassium chlorate, does away with the necessity for the chlorinated soda, which it was necessary should always be fresh. The author stated that the occurrence of indicanuria in typhoid was almost always to be found, although there are only certain cases where it is severe enough to demand especial attention. This condition, he stated, is to-day looked upon as being caused by materials putrefied in the intestinal tract; it is not claimed that it is a poisonous substance per se, but that through the absorption of it, other poisonous substances are formed, and we are, therefore, in the habit of looking upon indicanuria as demonstrating auto-intoxication of intestinal origin, and the conditions present in typhoid are those in which we would expect to find indicanuria present quite frequently. The treatment properly resolves itself into treatment for the auto-intoxication, which we are very well able to conduct during the first and second week of the disease, but from the third week until about the twenty-fifth day we are compelled to abandon purgative measures from the danger of perforation, and during which period the intestinal tract should be kept as much at rest as possible. It was stated that putrefying materials in the mouth, thus causing infection of the food, were believed to be a fertile source for this infection, and it was recommended that the mouth be kept in a thoroughly hygienic condition by frequently rinsing out, aided by the application of peroxide of hydrogen, if necessary, and

careful attention to diet. The use of fractional doses of calomel during the first two weeks of the disease, was recommended as an intestinal antiseptic, and it should be employed by placing the powder dry on the tongue, and allowing it to dissolve and slowly find its way into the intestinal tract. The calomel should always be given in combination with some inert substance, such as sugar or milk. The use of this remedy can also be resumed during the last week of the disease, when the danger of perforation is over. Beneficial results are also frequently obtained from the use of one dram of phosphate of sodium dissolved in a glass of hot water and given in the early morning. An occasional enema of normal salt solution at a temperature of 100° F. during the first two weeks of the disease may be valuable in relieving the constipation.

Dr. Anna E. Broomal showed the temperature chart of a case of typhoid fever of sixteen weeks' duration, with a temperature of 106° F. and a pulse of 180°.

Dr. Samuel Wolfe emphasized the value of the use of the thermometer in office practice and urged upon the members to adopt its use more generally, stating that he believed this would be the means of making much more accurate diagnoses. He felt that in the diagnosis of typhoid fever, the combined symptomatology should be considered, while the Widal reaction will undoubtedly occur in cases where the disease has been previously existent, a positive test will add weight to the other signs. Reference was made to the unusually large number of atypical cases which had occurred lately, and the value of a close study of indicanuria in this and other conditions commented upon.

Dr. Mordecai Price urged the use of calomel throughout the entire course of the disease, if indicated, and felt that the fear of perforation should not be allowed to preclude its employment. When there is a rapid pulse, normal or subnormal temperature, drawn facial expression and flabby peritoneum, perforation should be anticipated and operation done at once.

Dr. W. Duffield Robinson referred to a case in which the disease had lasted seventy-nine days with a continuous temperature; after the seventieth day he had begun the use of salol dissolved in white vaseline oil, the oil passed the bowel and was followed in nine days by a normal temperature. A case was reported of a dental student who had an attack of typhoid sometime before the Christmas holidays. On his return after the holidays he was taken with nausea and pain in the abdomen, which three hypodermic injections of morphine failed to relieve, and the next morning he was found to have a typical recurrent attack of typhoid. In the house where he had been taking his meals there were several other students (table boarders), all of whom took the disease, as well as the proprietor and his wife, the proprietor dying in six days after the onset of the condition.

Dr. Samuel P. Gerhard reported a case of typhoid fever complicated by colicystitis, which began in the usual way with headaches and high temperature, the latter symptoms being absent after the first week, at which time the delirium was very great. Calomel being given to relieve the constipation, salivation ensued, but during the fourth week she got up and stated that the abdominal tenderness had disappeared. Suddenly she complained of tenderness in the right side, stating that she felt as though she had eaten something that did not agree with her, based upon which supposition she was prescribed for. The speaker, being called to see her about midnight, found her suffering from intense pain in the right side extending over the back; and examination revealed a large lump on the right side, with perceptible swelling over the right chest. This subsided the next day and she appeared to improve for two or three days, when suddenly the pain returned and the swelling increased very much. Dr. George Ross was called in and obstruction of the bowels with possibly involvement of the gall-bladder suspected; there was no vomiting and the temperature was normal. After this condition had persisted for about a week she was removed to the hospital, and an operation revealed, upon lifting up the right lobe of the liver that the gall-bladder was gangrenous; and upon lifting up the left lobe about a quart of pus flowed out; the gall-bladder was suppurated and contained between 40 to 50 gall-stones. A drainage tube was inserted and the patient is progressing toward recovery, the bile flowing freely and the stools have resumed a normal color, showing that the cystic duct and the gall-duct are all right.

Dr. A. Bernheim recommended that the patient be kept as quiet as possible during the progress of the disease, and felt that it was especially derogatory to have a mirror in the room where the patient could see his own reflection, as it was apt to exaggerate the delirium. In reference to calomel, he stated that salivation had occurred much more frequently when he had used it in fractional doses than when he had employed it in larger quantities.

Dr. Wm. Egbert Robertson, in closing, felt that calomel could be used without detriment throughout the entire course of the disease, and referred to the reports of the Massachusetts Hospital collected by Dr. Fitts, which show that the mortality in this disease has not varied more than 1½ per cent. since 1836; being 11½ per cent. that year and last year it was 10 per cent., calomel being invariably used to the point of salivation in that institution.

Dr. A. Bern Hirsh, in closing, recommended prompt surgical interference in all cases of intestinal perforation and urged upon the members the necessity for careful observation in order to detect this condition. The value of dilute muriatic acid, especially in those cases where there is a furred tongue was commented upon.

Dr. Judson Daland, in closing, felt that the principal reason for the occurrence of salivation following the administration of fractional doses of calomel was the improper condition of the patient's gums, which should be carefully looked after. Muriatic acid was thought to be of value, and can safely be employed with the calomel, provided the two remedies are not given too close together.

Stated Meeting, held May 12, 1903.

The President, H. Brooker Mills, M.D., in the Chair.

SYMPOSIUM ON DYSMENORRHEA.

The Etiology of Dysmenorrhea.—Dr. J. Thompson Schell read this paper, in which he stated that the cause of the condition was a much discussed fact and is not established on any distinct scientific basis, dividing the causal factors into three groups: (1) local or pelvic, (2) general or constitutional, and (3) reflex. He stated that any diseased condition of the pelvic organs might be sufficient to cause dysmenorrhea, while on the other hand, apparently normal pelvic organs are found associated with severe dysmenorrhea, and it is not unusual to find all kinds of pelvic lesions, viz., antiflexions, various inflammatory conditions, etc., and no dysmenorrhea. He called attention to the fact that the old theory of mechanical obstruction to the flow is not so widely accepted as formerly, although antiflexion with much angulation is often associated with dysmenorrhea. The normal phenomenon of menstruation is strikingly similar to a pathological inflammation and nature makes provisions for the swelling incident to this phenomenon, but when there is any pathological condition present which would interfere in any way with the normal swelling, pain would naturally result. He believed that gout, rheumatism, anemia, general neurasthenia, etc.,

have all at times a causal relation to dysmenorrhea. The neurotic element is present in all cases, sometimes being the only cause and at all times having some influence on the production of the pain. The relationship between the nasal mucous membrane and the pelvis seems to be proven by the fact that applications of solutions of cocaine to the nose will in some cases relieve the dysmenorrhea and bring about a permanent cure.

The Medical Treatment of Dysmenorrhea.—This was the title of a paper read by Dr. Frank C. Hammond, of Philadelphia, in which he stated that in order to rationally treat a patient for dysmenorrhea the cause should first be ascertained; but there is a large class of cases in which the causative pathological conditions cannot be definitely determined. The treatment of dysmenorrhea may be divided into (1) the prevention of the attack, (2) the treatment of the attack, and (3) the treatment between attacks.

1. In cases depending alone upon congestion much good can be accomplished by free purgation the day of or the day previous to the flow. In girls in whom a demonstrable pathological condition cannot be ascertained, and in whom there is a normal anatomic relation of the pelvic organs, the tincture of gelsemium frequently affords the greatest relief; too much praise cannot be bestowed upon this drug when employed in this class of cases. It should be given ten drops three times a day, beginning a week previous to the beginning of the flow. Apiol, cimicifuga and permanganate of potassium are also useful.

2. All cases are benefited by rest during the period, in bed, if necessary; hot vaginal or rectal douches, and a hot water bag over the abdomen. When the pain is of a neuralgic character, antipyrin, gelsemium, cannibis indica, the bromides, caffeine, sodium benzoate, and viburnum prunifolium alone or in suitable combination are indicated. When congestive, with or without malposition of the uterus, free saline purgation, hot douches and hot sitz-baths. In addition to the drugs mentioned, the tincture of piscidia erythrina may be used with advantage, as may also the tincture hydrastis. The routine employment of opium was condemned and it should be employed only as a dernier resort. When the dysmenorrhea is due to vasomotor spasm, one one-hundredth of a grain of nitroglycerin, repeated in an hour, if necessary, will afford immediately relief. This drug is useless if employed otherwise than as herein indicated. The results of nasal therapy in dysmenorrhea, as reported by Flies, Ephraim, Linder and others are detailed.

3. The general health should be promoted by tonics, proper exercise, baths, suitably adjusted clothing, and attention to the bowels. Pelvic congestion should be depleted by local treatment, the use of the tampon, antiseptic and astringent applications, vaginal douching, high rectal injections, pelvic massage, local blood letting, atmocausis and the pessary. Intra-uterine applications are not to be recommended except for membranous dysmenorrhea. In all cases in which there is a demonstrable pelvic lesion, medical treatment is only palliative, surgical measures are necessary to effect a cure.

The Surgical Treatment of Dysmenorrhea.—This paper was read by Dr. William E. Parke, in which he divided the cases of dysmenorrhea into two classes: (1) Those curable by dilatation and curettage, and (2) those not amenable to surgical treatment. He divided the case of dysmenorrhea amenable to surgical treatment into (*a*) true obstructive dysmenorrhea; (*b*) membranous dysmenorrhea; (*c*) spasmodic dysmenorrhea; (*d*) congestive dysmenorrhea. The symptoms of true obstructive dysmenorrhea, he stated was a cramp like pain resembling those felt in labor, and may be caused by a new growth following operation, cancer, fibroid, or cicatricial tissue following operation; for the first two causes removal was recommended, while in cancer it is usually too far advanced to permit complete removal and we must usually be content with scraping out the canal. If the condition is due to cicatricial contraction following operation dilatation and curettage should be done, and the same is true if the pain is produced by antiflexion and angulation of the canal. Curettement should be done in all cases as the endometria are nearly always diseased. Membranous dysmenorrhea comes on at the beginning of the period and the pain increases in severity until the membrane is expelled, and wide dilatation, curettement and the application of carbolic acid were recommended. Spasmodic dysmenorrhea is characterized by severe cramp-like pains, usually of short duration, although they may continue sufficiently long to lose this distinction; they may extend over the whole pelvis and may or may not come and go with the menstrual flow. Many of these patients are sterile, recumbent posture gives but little relief, and some cases state that they are relieved themselves by alcohol. He believed that the operation of dilatation and curettage found its greatest field of usefulness in these cases, the reason for this being probably that the internal os in this condition is unusually sensitive and acts as a sphincter, and that forcible dilatation paralyzes the muscular fibers and relieves the spasm. In congestive dysmenorrhea, the pain precedes the flow by some days or a week, and may be simply an exaggeration of the aching that so commonly accompanies menstruation or it may be sufficiently severe to confine the patient to bed. The pain is situated in the pelvic area and does not give rise to the tossing about, fainting or vomiting, being often dependent upon changes in the uterus itself or its appendages, such as chronic metritis or endometritis, retroflexion, fibroid tumors and inflammation or prolapse of the tubes. When the condition is one of congestive dysmenorrhea pure and simple, surgical treatment is not indicated, but when it is secondary to the other conditions indicated, surgical treatment offers practically the only hope of relief. Dilatation and curettement, together with a removal of the appendages, if diseased, or in the case of a retroflexed uterus restoration to its normal position being the operations recommended. When fibroid tumors are the cause, their removal was advised, although dilatation and curettement will often give some relief. He called attention to the fact that there was frequently an association of one or more of the different conditions, and, therefore, care should be taken not to give too favorable a prognosis. He called attention to the fact that ectopic pregnancy was very often mistaken for dysmenorrhea and recommended thorough examination in all cases. If the appendages are diseased dilatation and curettement are contra-indicated unless the diseased appendages are removed simultaneously. He described the technic of the operation and laid especial stress upon the necessity for antiseptic technic in its performance.

Dr. F. Hurst Maier stated that in referring to the case books of the Jefferson and St. Joseph's hospitals, he found that the majority of the cases designated as "antiflexion with dysmenorrhea" occurred in married women and were sterile. He stated that in 135 of the cases the cause was designated as an inflammatory one, either of the uterus, the tubes or the ovarian structures, or in the form of a parametritis or cellulitis, being associated in a certain number of instances with a congenital antiflexion with an elongated cervix and shortened vaginal walls, but he believed that there was no doubt that, in certain classes of cases of dysmenorrhea, at least, the inflammatory condition was the cause of the pain. He believed that the old theory of mechanical obstruction

was entirely done away with and that when the pain is spasmodic we usually find it associated with some pathological condition. He felt that the majority of cases of vascular or nervous origin occurred in young unmarried women and better results would be obtained by vigorous general treatment to build up the nervous system, and their general condition, regulating the bowels, attention to the bladder, occupation, diet, rest and proper remedial agents during the menstrual period. In regard to surgical treatment, in those cases in which there is a distinct pathological lesion, such as fibroids, surgery must be resorted to; in cases of antiflexion of the uterus dilatation and curettage are the operations of choice; while in cases of hypertrophied elongated cervix, with shortening of the anterior vaginal wall, he recommended that the Dudley operation on both the anterior and posterior wall be used to supplement the dilatation and curettement.

Dr. A. B. Hirsh reported three case of pin-hole os cured by dilatation; all three having since married and two of them having borne children with no return of the dysmenorrhea. In each case the pain was absent until one week of the time of menstruation, increasing in severity during that time; in one case becoming so severe as to cause agonizing shrieks. Treatment was directed to the general condition in each case prior to the operation.

Dr. J. Thompson Schell reported a case of appendicular colic associated with dysmenorrhea, in which the dysmenorrhea was cured by the removal of the appendix. While he believed a dilatation of the cervix was of value he felt that we should not be too sanguine of a cure in these cases of pin-hole os, by means of this treatment.

Dr. Frank C. Hammond, in closing the discussion, remarked that he had found hot vaginal douches of value in these cases. He believed that whisky should be employed with caution, owing to the liability of the alcoholic habit being formed. In regard to membranous dysmenorrhea, he believed that pregnancy was as near a cure as could be established, but that it was very difficult for pregnancy to exist under these circumstances.

Dr. William E. Parke, in closing, referred to a number of cases of membranous dysmenorrhea which had come under his observation at the Kensington Hospital, some of which had been cured by the treatment outlined in his paper. While these cases may be relieved for several months, he expressed the opinion that they were rarely permanently cured.

Dr. Anna M. Reynolds reported a case of a monstrosity occurring during a twin pregnancy, exhibiting the specimen.

Dr. E. Franklin Smith, of New York, reported a case which had come under his observation a few years ago, in which the abdominal wall of the child ruptured during delivery; the child was perfectly formed, except the anterior abdominal parietes, which was almost as thin as an egg's membrane, every vestige of muscular fiber from the pubes to the ensiform cartilage and from the median line to the spinal column being missing.

HARVARD MEDICAL SOCIETY OF NEW YORK CITY.

Regular Monthly Meeting, held April 25, 1903.

The President, Frank H. Daniels, M.D., in the Chair.

Fusiform Dilatation of the Esophagus Simulating a Diverticulum, with Report of a Case.—This is the title of the paper of the evening, which was read by Dr. William B. Coley, in which operation was followed by a fatal termination.

Obstruction of Esophagus.—The patient was complaining of considerable difficulty in swallowing, so that he had been unable to take food or drink for some time, the condition being complicated by a swelling in the thyroid region and the return of swallowed material unaltered, so that it was evident it had not been in the stomach. The most interesting feature of the case was the occurrence, after the taking of a second glass of liquid, of a growing prominence in the anterior cervical region that made the thyroid project very noticeable. Such swellings have been noted in connection with diverticulum of the esophagus, which occurs by preference in this region, as Dr. Coley showed by the illustration from Nothnagel's monograph on obstruction of the esophagus in his encyclopedia of pathology and therapy.

Family and Personal History.—The patient was about forty-five years of age, was born in the United States and says that his mother died with cancer of the uterus. His own first symptoms consisted in inability to swallow meat and bread, the material getting stuck, as he said, in the lower part of the neck. Since that time he has had to be careful to use practically nothing but liquid food. Three years ago he began to notice that a swelling occurred here whenever he swallowed. Usually when the material swallowed was soft he succeeded in getting it down. For the last three months, however, even liquid food has often refused to pass, and, as a result he was losing weight very rapidly. For the last ten days he has been able to take only one soft-boiled egg. Inspection and palpation show a distinct swelling at the right of the thyroid and while the act of swallowing seems easy, this swelling occurs after a glass and a half has been taken and few minutes later the whole quantity is regurgitated evidently without any of it having reached the stomach. The passage of a stomach tube shows that an obstruction exists about 7½ inches from the teeth. After considerable manipulation, however, the tube could be passed on into the stomach. Because of this it was resolved to feed the patient, in order to make his condition better for operation. The food was given by the stomach tube but the patient did not gain very much in weight. It seemed evident that a diverticulum of the esophagus existed at the usual location for such a pathological condition. As is well known this condition is apt to occur in the neighborhood of the cricoid cartilage and it is said to be due to the pressure of precocious bony degeneration of the cricoid ring, producing thinning of the esophageal wall. As the patient was growing weaker in spite of the tubal feeling, operation was decided on after four days, in the hope that the pouch might be removed and the entrance to it closed up so as to give ease in swallowing once more.

Fatal Termination—Autopsy.—The dilatation of the esophagus was found to extend very deeply down to the thorax. It was fusiform in character, involving the whole diameter of the esophagus and nothing could be done to relieve it. The patient died on the second day after the operation from congestion of the lungs, which had not gone on to the pneumonic stage. The congestion was thought to be due, to some extent at least, to absorption of thyroid substance, since the most prominent pathological condition found in the thyroid gland, when that gland was exposed, was a large tumor of the right lobe of the thyroid extending down below the sternum and evidently bearing a distinct etiological relation to the obstruction of the esophagus, since its presence must have caused pressure upon the important nerves in this region. The tumor was found to be largely cartilaginous in composition and was very difficult of removal because of the free bleeding from enlarged veins which ensued when its substance was incised. This tumor was evidently of slow growth and, though non-malignant in character, was of the kind that might readily take on malignancy. It had apparently

been growing since the first manifestation of symptoms in the case and the fact that portions of it were below the sternum made the pressure symptoms produced by it much more serious than would have been the case if the enlargement had occurred in the neck above the sternum.

Autopsy Findings.—At the autopsy it was noted that no septic condition was present and the esophagus itself had been very little interfered with. The autopsy showed besides a constriction of the esophagus at the point where the difficulty of swallowing occurred and then a spindle-shaped dilatation of the esophagus reaching down to the cardiac end of the stomach. This dilatation of the esophagus was thought to be due to the pressure of the tumor of the thyroid previously described.

Diverticula of the Esophagus.—Modern methods of diagnosis are making it clear that this condition is much more common than has been thought. In 1880 there were only 18 cases in the literature. In 1890 some seventy cases could be collected. Some of the fusiform dilatations of the esophagus reported have been very pronounced. Rokitansky described a case in which the esophagus was as large as the arm of a patient. The common symptom of these cases is the feeling of the patient that food never reaches their stomach. At times, besides the dilatation of the esophagus, there is a lengthening of it, which causes it to assume something of a serpentine form. Dilatations are usually due to spasm of the cardiac orifice with secondary relaxation of the muscle above. Sometimes these dilatations occur as the result of even functional or so-called hysterical spasm of the esophagus. The mechanism of their production in these cases is not easy to understand.

Incidence of Diverticula.—Diverticula of the esophagus are likely to occur in either sex and have been reported at all ages from twenty to extreme old age, though the symptoms are commonest in the two decades between twenty and forty. The prognosis of the condition is very unfavorable, since, after a time, most of the food finds its way into the diverticulum and is vomited thence without serving in any way for the nutrition of the patient. Death from inanition is almost the rule in unoperated cases and is apt to be slow and painful. Operation is not as unfavorable as might be expected and in recent years the proportion of recoveries has been constantly growing in the hands of good surgeons. Operation should be suggested, however, before the patient has become exhausted by the condition.

Radical Operation.—Dr. Maurice H. Richardson, of Boston, has recently reported some cases in which he has succeeded in extirpating the diverticulum closing the opening into the esophagus and bringing about a complete cure of the pathological condition. In the literature there are some 56 cases reported, 17 of which have been operated upon with only one death. Diverticula are often spoken of as pressure diverticula, especially when they occur in the upper part of the esophagus and it is a very curious observation that in most of the cases no stricture is found to account for the beginning of the diverticula pouch. It is not always easy to decide what is the source of the pressure that leads to the weakening of the esophageal walls. In the present case the fusiform dilatation of the esophagus was evidently due to the pressure of the thyroid tumor.

Similar Case.—Dr. Palmer Cole said that he had recently had experience with a case having many of the features of the case described by Dr. Coley. The patient is a young man of twenty who came to Dr. Cole's office in a state of extreme distress with a very anxious face, blue hands and lips and clammy coldness of the extremities and complained that he was choking. He had the feeling of a lump in his throat which made it impossible for him to swallow and he frequently put his finger to his collar, as if to relieve some constriction. He had taken no solid food for two years. On the morning before his visit to Dr. Cole's office he had swallowed some dry cracker, but had not succeeded in getting it down. To this he attributed his exhausted condition. Dr. Cole exerted a gentle pressure upon the tumor present in the cervical region and after a time massage seemed to give some relief. The patient was given ten grains of carbonate of ammonium as a temporary stimulant and this seemed to get to the stomach without difficulty. In order to carry out the massage Dr. Cole had to get his fingers deep down under the sternum and this seemed to relieve the condition as if something had been dislodged.

Dr. H. S. Spooner, in discussing the case, said that just above the spasm of the esophagus hypertrophy of the muscular walls occurs and this is apt to be followed by dilatation. If the dilatation occurs more in one part than in another, that is, if there is a localized weakening of the muscles, a diverticulum results. If not, then a more or less regular dilatation occurs.

Difficulty of Diagnosis.—Dr. Walsh said that he had seen a case of functional stricture of the esophagus in Professor Nothnagel's clinic, which illustrated very well the difficulty of diagnosis in these cases. For several years a young man had had a series of attacks of difficulty of swallowing. For days at a time he would not be able to get anything into his stomach, even with the greatest effort. Usually after the passage of a sound he secured control over his swallowing mechanism, until some emotional strain or overwork or worry made him liable to have this spasmodic constriction of the esophagus once more. Professor Nothnagel was of the opinion that the recurrence of these spasmodic constrictions might ultimately lead to the production of a diverticulum of the esophagus. There seemed to be absolutely no reason for the recurring spasm, except the intensely neurotic condition of the patient, who had a family history with nervous tendencies on both sides. Dr. Walsh said that on the other hand the recognition of malignant stricture was not always easy since it ran a more or less latent course until serious narrowing of the lumen of the esophagus had been brought about. In some patients very little complaint was made until actual impossibility of swallowing solid food developed. In a case seen in Vienna the man had found difficulty in swallowing solid food only for a few days when somebody suggested that such difficulties of swallowing might be overcome by taking a quantity of pepper seeds in a glass of beer. This was followed by complete inability to swallow anything, even liquid, and the sounds could not find any passage into the stomach. At the autopsy it was found that the pepper seeds, about the size of peas, had lodged in a tortuous canal which represented the lumen of the esophagus through a rather long malignant growth of that organ. Their presence had given rise to some edema which absolutely closed esophageal opening and made even the passage of liquid impossible. The case illustrates the possibility of latency in malignant cases until serious conditions may follow attempts at swallowing solid food and when the diagnosis from the suddenness of the attack and the absence of previous history may lead to a suspicion of the functional character of the affection.

Dr. Coley in closing the discussion, said that in these cases it is often a mystery how the stomach tube passes, yet, after the swallowing of even a few drops of liquid, reflex spasm occurs with complete closure of the esophagus. It is curious that sufficient hypertrophy of the muscles of the esophagus above a functional constriction does not occur to enable the esophagus to pass on the food in spite of the resistance. Curiously, however,

little hypertrophy of the esophageal muscles is found at the autopsy of these cases, as a rule.

Hodgkin's Disease Relieved by X-rays.—Dr. Coley reported a case of advanced Hodgkin's disease, in which a great improvement of symptoms with reduction in the size of glandular swelling occurred as a consequence of repeated exposure to the X-rays. The patient was a man of forty-five years who noticed four months ago that the glands on the side of his neck were becoming enlarged. After these his axillary glands then his inguinal glands became involved. Then he lost considerably in weight. His spleen reached within a couple of inches of the opposite anterior superior spine and in its lowest portion was down almost to the pubis. The blood count showed the presence of 70,000 leucocytes with a number of red cells distinctly below normal. The X-rays were employed as a last resort, though without much hope. Exposures were made of the enlarged glands in the neck and axilla for some ten minutes at a time, four times a week. He began to improve at once. Within two weeks the spleen was distinctly smaller, the glandular swellings had gone down on the sides and the number of leucocytes was markedly reduced. After six weeks of treatment the leucocytes came down to 12,000 and the spleen was reduced to less than one-fourth its original size. Now practically all the glandular enlargements are gone and the man has gone back to his work. He considers himself entirely cured.

Ultimate Prognosis.—The ultimate prognosis in cases that are relieved by exposure to the X-rays is not as good as might be anticipated from the prompt improvement which takes place and the amelioration of the general condition which follows. Dr. Williams, of Boston, who has large experience in X-ray work, reports some cases of Hodgkin's disease in which prompt improvement took place, yet the affection recurred and ultimately with fatal termination. Dr. Senn, of Chicago, reports two cases entirely cured by the X-rays, but the time since the relief of symptoms is not long enough to be definitely assured against return. Dr. Senn inclines to the opinion that Hodgkin's disease is due to an acute infection. There are some who consider that the enlarged glands are really the result of a generalized glandular tuberculosis. Tuberculous inoculations were made into guinea-pigs, but the animals disappeared just about the time autopsies were to be made—stolen from the laboratory, it would appear—and so the result was not known.

Continuous Ether Apparatus.—Dr. H. S. Spooner described an apparatus for the giving of ether continuously during mouth operations in such a way as to avoid interference with the operator by the presence of a cone or other large inhaling apparatus. The tube through which the ether is given is fastened in the angle of the mouth and the ether flow is regulated by means of valves. No special irritation of the mucous membrane takes place and the operative work may be continued without any attention to the anesthesia, which can be made as deep and long-continued as is necessary.

Spindle-cell Sarcoma and X-rays.—Dr. Coley described a case of a woman, who came from Boston in the spring of 1901, suffering with a large tumor in the right iliac fossa. This was entirely too large to permit any hope of radical removal and extended up as high as the umbilicus. It had been growing larger and harder for some time when the patient came to be treated by the mixed toxins of erysipelas and the *Bacillus prodigiosus* with the hope of possible relief. Under the repeated injection of the toxins the tumor began to decrease in size, but after some time the decrease stopped and it remained at a standstill. Even this was a distinct improvement over the condition of rapid growth that had been the rule before. After a time, however, the toxins evidently lost their influence and the tumor began to increase in size again. The abdomen became as large as that of a woman in the eighth month of pregnancy and the general health became very unsatisfactory. The case seemed utterly hopeless and the patient herself had given up all prospects of relief.

Immediate Improvement Under X-rays.—As a last resort the X-rays were tried and, after a time, improvement began once more. There were periods of fever evidently due to the absorption of septic material from the broken-down tumor which was disintegrating under the influence of the X-rays. After three months of treatment she was so much improved that she began her occupation of teacher once more in the fall, and went to Boston only on Friday, Saturday and Sunday for treatment. She has now become practically well and the tumor has entirely disappeared. She is an intelligent person and describes very clearly just how the series of changes took place which brought about the disappearance of the tumor. After exposure to the X-rays she would note a spot of the tumor sorer and tenderer than the rest and then it would become distinctly less hard. After a time a hollow would form at this point, showing that there had been absorption of material and this hollow would increase in size by absorption from its edges. During this process of absorption fever always occurred, but this subsided of itself after a time.

THE MEDICAL ASSOCIATION OF THE GREATER CITY OF NEW YORK.

Stated Meeting, held at the New York Academy of Medicine, May 11, 1903.

The Vice-President, Ransford E. Van Gieson, M.D., in the Chair.

Experimental Researches on Resuscitation After Death from Chloroform.—This was the title of a paper by Drs. Robert Coleman Kemp and A. W. Gardner, which was read by Dr. Kemp. In addition to reporting a series of experiments conducted by the authors, it was proposed to describe a simpler and what was believed to be a safer method of massage of the heart than that which was first credited to Prus, and to call attention to certain facts in attempted resuscitation from anesthetics, drowning and allied conditions, which might possibly be of practical benefit. The general method of preparing the animal to be experimented upon was described, after which it was stated that in some cases respiratory tracings were taken by means of a compression bulb held in position by a band strapped about the chest. No further respiratory tracings were taken after the operation of opening the chest was begun. In some of the animals only cardiac tracings were taken but careful note was made above these the instant respiration ceased. In others no tracings were taken, but the following important facts were noted: The time of cessation of heart and respiration; the period when the partial movements of the heart ceased, after the thorax was opened; the length of time thereafter that massage of the heart was begun; the time the heart began to beat alone.

In some cases, when the heart seemed flabby and empty and did not react to massage, a small infusion of normal saline solution at 120° F. was given, as an additional stimulant, and also to furnish fluid to work upon. When the heart seemed dilated and full of blood, this was unnecessary. After resuscitation such an infusion, given before removing the animal from the Nélaton to the dorsal position, in order to prevent shock, was found extremely efficacious. Artificial respiration was continued until the wound in the chest

was closed for the purpose of preventing collapse of the lung. In all cases, after the chest was opened, the heart was allowed to come to an *absolute standstill*, without the slightest movement of any description, even partial, being perceptible from sight, feeling or compression. A period of three, five, ten, and, in one case, nearly sixteen minutes was allowed to elapse before massage of the heart was begun. (The tracings were demonstrated, and accurate figures given.) As to the mode of death from chloroform inhalation, in most of the cases respiratory failure occurred first, followed by heart failure. In several instances, however, heart and respiration failed synchronously. In one case the heart failed as if it had been pierced.

The Limitations of the Usual Methods of Resuscitation Demonstrated by the Kemp-Gardner Experiments.—A careful study of these demonstrated the following facts: The chloroform was pushed to the point of complete respiratory and cardiac failure. The heart-beat could not be detected, the pulse could not be felt, nor could pulsation be obtained in the carotid and femoral arteries, which were previously dissected out, the one for attachment of the manometer, the other for infusion into the vein. The animal, clinically, is apparently dead; yet even at this stage the manometer tracings demonstrate an occasionally and scarcely appreciable cardiac beat. Physiologically, death has not occurred; and, in fact, not clinically, for even in this extreme condition the animal can still be resuscitated by the usual methods—infusion with hot normal saline solution, inversion, artificial respiration, hypodermics, etc. If, however, no effort at resuscitation is made, the manometer tracings finally cease absolutely, and the animal, according to the physiologist, is at last dead. If the thoracic cavity be now opened and the heart carefully examined, it will be noted that though the organ in its entirety has absolutely ceased to beat, yet for a time (several minutes in many instances) there is a partial muscular contraction occurring occasionally in one or both ventricles, which, however, is so slight and incomplete as to produce no trace by the manometer. Even at this stage the usual methods of resuscitation will restore the animal in some cases. Finally, and in the last stage, the heart becomes absolutely motionless and inert, to sight, touch and compression. Though the vital spark exists, as may be demonstrated by the radical method of restoration, yet the animal may be considered as *dead*, since the usual methods of resuscitation at this point absolutely fail. Some *vis a tergo* agency is positively essential to start up the heart action, and it is, moreover, necessary that this should be quite vigorously applied. It is this indication that cardiac massage, and that alone, fulfils, for it must be remembered that there results from its employment not simply the interesting experiment of the return of heart-beat for a period of time, but an actual restoration of all the bodily and mental functions.

Results of Cardiac Massage.—From the standpoint of the clinician, the authors believe that in certain cases cardiac massage is of practical utility, and that, so far, it can be replaced by no known method. They succeeded in resuscitating 11 out of 23 animals (dogs) after absolute cessation of heart-action to sight, touch and compression of the organ, and that, too, after it had remained in this condition for variable periods without any efforts at resuscitation. In nine of the animals the functions of intelligence, drinking, urination, defecation, etc., were restored to normal. In many of the animals under experimentation, artificial respiration, inversion, infusion with hot normal saline solution, etc., were tried, with resulting failure until cardiac massage was added to the treatment.

Methods of Massage.—The method usually advocated consists in the resection of several ribs, the insertion of the hand into the left pleural cavity, and rapid manual compression of the heart. In the experiments several methods were tried, including the above. Some successful cases were secured by each, but one of these was found to be far safer and more rational than the others. This was described as follows: The animal is placed in Nélaton's position, which throws the heart forward against the chest and somewhat upward. An incision is made over or slightly below the apex, and, if necessary to secure more space, a small piece of the fifth and sixth ribs may be resected. The index and middle fingers are passed over the margin of the heart and behind it, near the apex, and pressure is made on the heart against the chest. Or, the opening being enlarged, the fingers may be placed behind, and the thumb between the apex and chest-wall, and the heart is then rapidly squeezed between them. It was found that a rapid intermittent (double action) pressure was the most successful in causing resuscitation, and this, in effect, imitates the dicrotism of the pulse, as is shown in the tracings. A rapid single action pressure was not so efficacious. In the operation upon the thorax it was found to be the best method to make an oval skin-flap, and, reflecting this forward, to open the thorax about the middle of the base of the flap. In some cases, during the compression of the heart, a small amount of hot normal saline solution (at 120° F.) was poured on the heart, through the thoracic wound, in order to prevent chilling of the organ. It is also well to wrap the animal in hot towels for the same reason.

After the heart has begun to beat alone the chest wound is rapidly sutured. As it was found that the manipulation in the chest might have a tendency to cause exudation, in most cases a strand of sterile gauze was inserted through a small counter-opening, for drainage, at the base of the flap. In order to keep the lungs well filled with air, artificial respiration was invariably kept up until the thoracic wound was closed. Before removing the animal from the Nélaton position an infusion of normal solution (4 to 6 fluid ounces at 120° F.) was given, to prevent shock. The manometer was then disconnected, the carotid artery and femoral vein tied off, and the external wounds sutured. The animal was removed to a box, wrapped in cloths, and given a hypodermic of morphine to quiet him. The dogs lived from two to twenty-four hours, and most of them became active and hard to control. The autopsies demonstrated in some cases that they had torn out sutures, with resulting pulmonary collapse and secondary hemorrhage. Some cases were infected through their own efforts, and some undoubtedly through the operators' hurried and insufficient attention to absolute antiseptic details. None of the cases in which the last method was employed showed any damage to the heart or pericardium. With a more perfect technic there seemed to be no reason why death should occur at all.

Hoyt's Pump for Artificial Respiration.—This instrument was devised for the authors by Mr. J. T. Hoyt, electrical expert to the physiological laboratory of the Medical Department of Columbia University. It is furnished with entrance and exit valves at the base, and by means of a V-attachment, oxygen and air can be administered in combination. It can be clamped to a table, and is readily taken apart. An improvised filter for the air can be attached, or a simple method devised to carry the air through gauze impregnated with an anesthetic, so that an operation on the lung can be carried on and collapse of the organ prevented. Each full stroke of the piston represents 22 cubic inches

of air, the normal inspiration being about 20 cubic inches in the adult. By means of a small governing-rod to regulate the height of the stroke (markings being placed on the rod), the piston-stroke can be made to correspond with the amount of air required to inflate the infant or child. This portable pump was believed to be extremely useful in resuscitation in cases of collapse on the operating table, in drowning, in gas or opium poisoning, and in respiratory failure in the newborn. (Dr. Kemp demonstrated the use of the pump on the body of a large dog.)

The Kemp-Gardner Intubation Tube for Artificial Respiration.—This has proved eminently successful for intubation of animals. It is practically an O'Dwyer tube with a hollow handle. The part entering the larynx, however, is somewhat shorter, while the distance between the bulbous enlargement which rests on the vocal cords and the curvature at the base of the tongue is slightly longer, to allow for the extended position of the head when the patient is inverted. There is a small opening in the upper surface of the tube which, by means of the thumb, can be regulated as an expiration valve. This tube is believed to be much less liable to damage the soft parts (larynx and cords) than the Fell-O'Dwyer tube. The authors consider that intubation of the larynx is the only accurate method to secure perfectly satisfactory artificial respiration. There can be no question that in a large percentage of cases artificial respiration is improperly performed.

Infusion.—Heat, as a cardiac stimulant, is one of the most important factors, and the temperature of normal saline solution, as Dawbarn has demonstrated, should be 120° F. This solution actually reaches the heart at about 110° F. If a higher temperature is employed (125° to 130° F.), some crenation of the red blood corpuscles occurs. When there are commencing signs of shock, a preventive infusion should be given. If this fails, a slow infusion of 1½ liters, continuously trickling into the vessel at a temperature of 120° F. for forty-five minutes, may be efficacious.

Complete Inversion of the Patient; Nelaton's Position.—The importance of complete inversion cannot be overestimated. The semi-oblique or oblique position is not sufficient. Dawbarn advises hooking the legs at the knee-joint over the edge of the table, and this might be employed with advantage in drowning cases, artificial respiration being performed while the patient is inverted. This would seem to be more efficient in clearing the chest and larynx than by the present methods in the practically dorsal position, and is undoubtedly more serviceable in stimulating the heart. In one of the experiments severe pulmonary edema was caused by too rapid infusion. By complete inversion of the dog, accompanied by artificial respiration, it was possible to pump out the lungs, the fluid flowing copiously from the animal's mouth.

Cardiac Massage Performed in the Human Subject.—In the summer of 1901, Dr. Kemp made use of this procedure in the case of a young girl who died suddenly from shock after a simple operation for opening an accumulation of pus in the left side of the abdomen, in which nitrous oxide gas was the anesthetic employed. The father gave permission to try massage of the heart, and the method described was adopted, but without success. The case was in every respect a most unfavorable one, as the patient was pyemic, and, in addition, weakened by several previous operations. In conclusion, the conviction was expressed that massage of the heart was both sound therapeutics and a perfectly justifiable measure in all cases of death from chloroform or any other anesthetic, as well as from drowning and allied conditions, when all other means of resuscitation have failed.

Simply an Arrest of Function.—Dr. William H. Thomson thought the importance of this matter could hardly be overestimated. In the experiments described by Dr. Kemp it would be difficult to call in question the main facts of the condition; for all intents and purposes the dogs were actually dead. But although they were dead, the mechanism of life was still intact. It was a characteristic of deaths from drowning and anesthetics that the mechanism was not all affected; there was simply an arrest of function, and therefore for a time there was a possibility of resuscitating the patient. It had occurred to him, however, as to the application of these experimental researches, that possibly what might be true for even the higher animals might not be true for man. The human heart, it was well known, was much more subject to shock. Still, he spoke only on a priori grounds, and the practical utility of the procedure described in the paper could be determined alone by actual experience.

Might Not Time be Saved by Approaching the Heart from the Abdomen?—Dr. R. T. Morris said it had occurred to him that perhaps a little time might be saved if the heart were approached from the abdominal cavity. In that case no time would be lost in resecting the ribs, and moreover many of the instances in which cardiac massage might be called for occurred during operations in the abdomen when that cavity was already opened.

Let the Lungs Collapse.—As to the maintenance of artificial respiration, while the chest was being opened, in order to keep the lungs filled with air, he thought it was a question whether this was not a mistake. Collapse of the lung was only a trifling matter. The artificial production of this condition was an excellent resource for the arrest of hemoptysis. He would, therefore, suggest that the lungs should be allowed to collapse until the operation was concluded. There would be no difficulty in getting them back to their normal condition afterward. In lung surgery one great trouble often was to keep the lungs collapsed, and nitrogen was almost the only thing that would do this.

Whisky and Morphine Before the Use of Anesthetics.—Dr. R. H. M. Dawbarn said it seemed not creditable to the profession that such wide differences of opinion should still exist as to certain points regarding both prevention and treatment. As to the former, with hardly any exceptions in twenty-two years' experience he had used a very small dose of morphine, guarded by atrophine, subcutaneously, and a large dose of whisky by the mouth, an hour before operating, and had never yet had cause to doubt its wisdom for several reasons. This was the rule also, he thought, among surgeons in this city.

Alcohol Unjustifiable in the Treatment of Anesthesia Narcosis.—As to the treatment, we see to this day a patient, with death already impending, commonly receiving alcohol in large amounts by the needle, a practice radically different from its use in *prevention*. According to Prof. N. C. Wood, this is little better than murder, for we are then treating by a narcotic drug a patient already too deeply narcotized.

Means of Resuscitation.—To speak of ways of undoubted value, whether the respiratory center or the heart be at fault, Dr. Dawbarn said he would advise a prompt inversion by aid of the knees hooked over the table, artificial respiration by the rapidly repeated compression of the chest wall, and very hot salt water (120 to 125° F.) poured freely into the rectum. Nélaton's position is of the utmost value in stimulating the heart by distending the right chambers by weight of blood. Of course, not a drop of blood between the feet and heart can reach the brain except by being pumped through the heart. As to the proper degree of heat,

whether by rectum or intravenous introduction, he worked this out in the Columbia Physiological Laboratory in 1890 to 1891 by aid of the kymograph and manometer, and Dr. Kemp has verified his results, then published. Although it must be seldom indeed that such a measure as cardiac massage will be needed, we owe Dr. Kemp much appreciation for putting this measure upon much firmer and more scientific grounds than was ever before the case. After the demonstration which had been given this evening, he thought no surgeon could be said to have done his whole duty in a case of anesthesia narcosis, where other means have failed, until he had resorted to massage of the heart. As to Dr. Morris's suggestion to open the abdominal cavity in order to save the time consumed in cutting away the ribs, there was no necessity whatever for such a resection, as the operation could be satisfactorily performed without this.

Opening the Chest for Hemoptysis.—As to opening the chest for the treatment of hemoptysis, he would consider such a procedure reckless in the extreme.

The Treatment of Chloroform Syncope.—Dr. Thomas L. Bennett said that in chloroform syncope the main dependence must be placed on mechanical means. Personally he had been invariably successful with the method advocated by Maas, which consists of the application of forcible compression of the chest over the heart sufficient to create an artificial carotid pulse, the compressions being made at the rate of 120 per minute. Inversion he believed to be unphilosophical and fraught with danger. As to the hypodermatic injection of drugs, this was practically useless in such an emergency, as they could not be absorbed until the crisis was passed and the patient on the road to recovery. In any case, where all other means had failed, he would not hesitate to resort to cardiac massage, and he believed that this procedure would prove of great value.

The Routine Use of Morphine and Whisky to be Condemned.—As to the routine use of morphine before giving an anesthetic, he was absolutely opposed to the practice. The narcotic effect of the drug often seemed to be doubled under these circumstances, and, besides, the patient might have an idiosyncrasy which would render it highly dangerous. He was also strongly opposed to giving whisky by the mouth, especially because it tended to promote vomiting. If alcohol were employed at all, it should be given by the rectum.

Reply to Criticisms.—Dr. Kemp said that while there might be some differences between the human heart and that of the dog, the similarity was sufficient, he thought, to justify the opening of the thorax and performance of cardiac massage in any patient in whose case the ordinary means of resuscitation had failed. In regard to Dr. Morris's suggestion, it seemed to him that as abdominal operations themselves were a frequent cause of shock, it would not be a very wise policy to open the abdominal cavity when the patient was already prostrated with shock. As to collapse of the lungs, he believed it was positively necessary to prevent this on account of the special relations which these organs bore to the heart, and that the maintenance of artificial respiration was therefore an important part of the procedure. In many cases of anesthesia syncope artificial respiration was of itself sufficient to restore the action of the heart. Collapse of the lungs was consequently a real danger. He was sorry to disagree with Dr. Bennett in regard to the question of inversion of the patient. It was a well-known fact that there is no better stimulus to the medullary centers, both cardiac and respiratory, than an increased blood supply, and the inverted position tended to promote this. If the patient was in a condition to respond to such stimulus, this of itself might start up heart-action.

THE NEW YORK ACADEMY OF MEDICINE.

SECTION ON GENITO-URINARY SURGERY.

Stated Meeting, held May 20, 1903.

John Van der Poel, M.D., Chairman.

The Choice of Technic in Operating Upon Prostatic Obstruction.—Dr. Chas. H. Chetwood read this paper, which will appear in a subsequent issue of the MEDICAL NEWS.

Personal Results Obtained by the Bottini Operation.—Dr. Willy Meyer, of New York, read this paper, and drew the following conclusions: (1) The operations making a direct attack upon the enlarged prostate gland were preferable to those aiming to exert an indirect influence. A direct attack should first be made in the case of every patient asking for relief. This failing, an operation on the testicles or vas deferens might then be resorted to; (2) Two useful operations were had for the direct treatment of the enlarged prostate, *i.e.*, prostatectomy and galvanocaustic prostatotomy (Bottini's operation); (3) In selecting the method indicated in any given case, one must individualize and be guided by anatomical, pathological and social conditions; (4) Prostatectomy was, of course, the most radical and most surgical procedure; it should be the operation of choice whenever promising success; (5) Perineal prostatectomy offered advantages over the suprapubic method, since it enabled the operator to do the operation under the direct guidance of his eyes. (6) Debilitated patients who seemed unfit subjects for the more radical operation should not be relegated to catheter life, nor should prostatectomy be done to "let them down easy;" they should be advised to have Bottini's operation performed. (7) Surgeons should familiarize themselves with both methods in order to be in a position to do justice to their patients. (8) It was the duty of those refusing to do Bottini's operation under any circumstances, to nevertheless advise patients who asked for more radical relief to have Bottini's operation done, if the operation with the knife seemed contraindicated. (9) The records of 59 patients upon whom he had operated, ranging in age from forty-seven to eighty-two years of age, 7 of whom died, either directly or indirectly from the operation, while 52 had recovered to a greater or less extent, were instructive. Much could be learned from these carefully elaborated statistics and further carefully compiled statistics as to the late results of both operative procedures—preferably in the hands of one man—were desirable in that they would increase our knowledge with reference to the selection of the proper method in the individual case.

Dr. Parker Syms said that the Bottini operation had always appeared to him to be a thoroughly unsurgical procedure and notwithstanding the claims made for it as regards its safety, he claimed it to be far more dangerous than the perineal prostatectomy and, at the same time, an operation which was not radical, inasmuch as it would only afford permanent relief to a few or small percentage of the cases. Years ago the profession came to the definite and proper conclusion that internal urethrotomy could not safely be applied to the deeper portions of the urethra. Certainly if that is true it is still more true that the electrocautery incision of the prostatic urethra, if done at all, should not be done by the internal method and, therefore, the speaker felt that the operation presented to the profession by Chetwood was far safer than that of Bottini. Dr. Syms claimed that prostatectomy done entirely through the perineum by the straight median incision was the safest means of affording definite relief to these sufferers. His own experience embraced 25 cases with but one death and he felt that, by his method of operating, any hypertro-

phied prostate could be removed through the simple median incision. In speaking of the mortality in the treatment of prostatic obstruction he made the statement that in those who had come to catheter life on account of this prostatic obstruction and acccompanied by cystitis, the mortality was 100 per cent. unless they were relieved by radical operation. With reference to the enucleation of the prostate he referred to his twenty-third case as an extreme example of celerity. This was a patient who had suffered from stone and who was in a very feeble condition and would not have been operated upon had he not required relief from this stone. He performed a perineal incision, exposed the prostatic urethra and apex of the prostate, opened the membranous urethra and, through that opening, performed a litholapaxy. Finally the anesthetizer suggested that the operation should be terminated quickly as the man's condition was failing. He then proceeded to enucleate the prostate at once and he was informed by one of the spectators that an absolute enucleation of the prostate in this case was accomplished in 45 seconds. He said that the operation ordinarily required from 30 to 45 minutes. In conclusion, he wished to pay a tribute to the admirable and unselfish work of Dr. Willy Meyer, who had made such unprejudiced investigations as to the merits of the Bottini operation. He felt that the medical profession was indebted to Dr. Willy Meyer for the results shown, though he always felt that the results showed the operation to be a dangerous and uncertain procedure.

Dr. Howard Lilienthal said that in dealing with hypertrophied prostates "doctors disagreed" and that in reply to the query "Who should decide?" he believed each doctor should decide for each case. Undoubtedly good results had been obtained by various methods and he believed that when a surgeon has been fortunate in the employment of one method and has become skilful in one particular operation, he was likely to continue employing that method or operation. It seemed to him that Dr. Sims took rather a narrow view when he insisted that *perineal* prostatectomy was the only form of prostatectomy to be employed. He agreed with Dr. Syms in believing that the operation of prostatotomy was not, as a rule, one to be recommended in all cases of prostatic enlargement. He believed, however, that in retention due to fibrous ring-like obstruction, in which hypertrophy plays no true part, prostatotomy might be employed with benefit. Dr. Lilienthal said he had had excellent results from suprapubic prostatectomy but he would be willing in proper cases to give the perineal method a trial. He asked Dr. Willy Meyer why he believed that section of, or injury to, the ejaculatory ducts caused impotence? It was his opinion, based upon clinical observation, that section of the ejaculatory ducts might cause sterility but did not cause impotence. Dr. Lilienthal said he had operated upon 14* cases, by the suprapubic method and had succeeded in curing 13 of the patients, so that they urinated normally and could completely empty the bladder. Some of the patients had suffered from stone and many from cystitis before the operation. One patient, himself a physician, had been operated upon one year before by the Bottini method with only temporary relief. When he first came under the speaker's observation there was complete retention and constant leakage. It was thought possible that the symptoms might be due to locomotor ataxia from which the patient suffered, this opinion having been given by a leading neurologist. On opening the bladder it was found that a median pedunculated lobe had been sagittally split into two equal parts by the Bottini incisor and these two parts fell together over the internal orifice of the urethra causing as complete retention as if they still consisted of one piece. This man made a perfect recovery and when Dr. Lilienthal saw him a few days ago he could completely empty his bladder and voided limpid normal urine. Suprapubic prostatectomy could be performed with great rapidity and the entire operation finished in from twelve to thirty minutes. Usually not a single vessel has to be tied, no vascular structures being divided. The incision was made in the median line through the linea alba and then into the bladder previously distended with air. In his later operations Dr. Lilienthal had avoided the use of counter-drainage in the perineum and he believed that this counter-drainage, in the presence of good siphon drainage from the suprapubic wound, was unnecessary and even harmful. The patient who died was uremic, partly aphasic before the operation, and this operation was done for complete retention. He believed that, in this case, it would have been wiser to have been satisfied with suprapubic drainage until the patient's general condition should have been improved when a prostatectomy would have been probably fraught with less danger.

Dr. James Pedersen said that recent literature showed some desertion from the Bottini operation in favor of prostatectomy, and a tendency to favor perineal prostatectomy as opposed to suprapubic. He inclined to the belief that, taking all operators and all cases into account, the Bottini operation was less serious than prostatectomy. He thought that an effort should be made to classify cases, and to regard some as better suited for prostatectomy than for the Bottini operation. In this the cystoscope is of the greatest help. He was inclined to favor freer drainage of the bladder in some cases after the Bottini operation than can be obtained by an inlying catheter of usual caliber, and therefore approved of Dr. Chetwood's perineal galvanocautery prostatotomy. He is convinced that certain cases could be greatly benefited, if not cured, by the Bottini operation, which certainly would not survive a prostatectomy.

Dr. Joseph Wiener, Jr., said that he had fortunately been able to see most of the cases operated on by Dr. Lilienthal, and had been persuaded by the good results obtained, to perform suprapubic prostatectomy in his own cases. Not only was the mortality low, only four per cent., but the patients that had survived the operation had all been absolutely cured. In not one of the cases was there pain or residual urine present after the wound had healed. Dr. Wiener emphasized the fact that if some of the previous speakers had seen the remarkable results attained by the suprapubic operation, they could not have made some of their statements. The statement had been made that prostatectomy should only be done when promising success. Suprapubic prostatectomy promised success in 96 per cent. of unselected cases. Moreover, the statement that debilitated subjects should not have a prostatectomy done was not borne out by experience. Dr. Wiener had performed suprapubic prostatectomy in a man of eighty-two years, and the patient had made a perfect recovery. Moreover, he had recently performed the operation, with gratifying results, under laughing gas anesthesia. The former of these operations had been done in fourteen minutes, and the latter in eleven minutes. Comparing the results of suprapubic prostatectomy with those of the galvanocaustic operations, the doctor said that he could not see why the latter operations, which in many cases were merely palliative, should be done, when the mortality following them was much higher than that following prostatectomy. In comparing the suprapubic operation with the perineal, the doctor said that he favored the suprapubic on account of the better exposure, and

* Dr. Lilienthal regrets to note an error in the figures originally given, namely, 23 cases. The error was a clerical one and was due to certain cases of malignant and suppurative disease having been counted in.

more especially on account of the rapidity with which it could be done. Dr. Parker Syms had said that it took from thirty to forty-five minutes to do the perineal prostatectomy. The suprapubic operation could always be done in one-half, and often in one-third of that time. Moreover, Dr. Wiener had been enabled to perform suprapubic prostatectomy without the use of ether or chloroform, and that, in old subjects, was surely a decided advantage.

Dr. Chetwood said there was nothing else for him to add, unless it was to reiterate the facts he had already brought out. He would dissent from the suggestion that the galvano-cautery operation was in anywise a palliative measure. It had been demonstrated in many of his cases that its effect was most radical. When several patients—not one case—who had been suffering from chronic pyelonephritis of an advanced type were operated upon by the method in question, the obstruction in the bladder relieved and complete abatement of the pyelitis followed, such a result could not be looked upon as palliative, but was most radical. When a large number of cases of complete and incomplete retention of urine, operated upon by the same method, were able to dispense with the use of the catheter and were relieved entirely of their retention, such a result could hardly be called palliative. He would not pretend to say that prostatectomy was not the operation of choice in some instances; but that there were many cases unsuited for this operation—cases of bar formation, of hard, fibrous enlargements, which could not be enucleated, that were better attacked by means of the galvano-cautery—could not be denied. He said that the reports heard, which gave so low a mortality, were very impressive, but could not be accepted as final in face of the incontestable statistics of other well known operators. There was one cause of death which always was a possibility, no matter how skilful the operator or how short the operation; and that was pulmonary or cardiac embolism, the chances of which were certainly much greater where glandular tissue was removed. He had seen a number of such cases. He felt that he could take to himself a part of the credit of the success of the evening, although he had personally contributed the least share toward it; as, on the invitation of the President, he had dictated the subject discussed, and it had been on this account that the President had extended the invitations to the gentlemen who had read papers and participated in the discussion.

Dr. Willy Meyer thanked Dr. Syms for his words and said that he had purposely followed up the Bottini operation tenaciously for five years to the exclusion of all other methods in order to find out *by personal experience* whether it had a place in the radical treatment of prostatic hypertrophy or not. As the result of such an experience he came to the conclusion that it had. He said that as much as he agreed with him that deaths that followed any operation should be counted as deaths due to that operation, still he could not do so in glancing over his own cases. Thus, if a patient, who had been operated upon by the Bottini method, developed for some unknown reason an acute phlebitis of the left saphenous vein and after having been thoroughly relieved from urinary retention died after a while from a pneumonia which, though no post mortem was made, was thought to be embolic, it would have been unjust toward the Bottini operation to count that case as one due to the interference as such. Further, if, in testing the Bottini operation, one tried to find out the best method of procedure for using spinal anesthesia with a sterilized solution of tropacocaine and the patient immediately after the injection and before the operation as such had been finished, showed symptoms of general interference with his well-being and died within the next few days with the same symptoms, it was also unjust to attribute such a death to the Bottini operation as such.

With regard to the question of radical relief of the prostatic trouble by means of galvano-caustic prostatotomy he said, that he had presented several patients to the New York Surgical Society and to other medical gatherings, to prove the effectiveness of this method of treatment. A number of patients thus operated upon had had no pain in urinating, emptied their bladders four or five times in twenty-four hours, and had less than one to two ounces of residual urine. In fact they felt perfectly well and cured. Therefore, he believed, it was absolutely incorrect to call the Bottini operation a palliative procedure as had been done by Dr. Wiener. He said that it was true that, in a number of cases, the operation would not cure but bring relief only, but this was not the fault of the operation but of the operator. As had been mentioned in the paper, Bottini's operation was a very difficult procedure with reference to carrying it out *properly* in a given case. Just as well the operation of litholapaxy might be termed a palliative operation because sometimes splinters of stone remain between the rugæ, were detected by the cystoscope later, and then crushed again or washed out at another séance. And yet, he said, litholapaxy was the operation of choice in operations for stone in the bladder. Of course it was much simpler for the surgeon to do a cutting operation and be able to immediately arrange it so, that the after-treatment can be taken care of by an assistant; but he said every surgeon would occasionally meet with patients in whom prostatectomy was absolutely contra-indicated. He knew there were colleagues who would refuse to recognize any procedure but prostatectomy. They would condemn such poor sufferers to the continual use of the catheter if they would not deem prostatectomy advisable, because, they say, there be no other choice for them. Whereas, he who knew that there is another operative procedure besides prostatectomy, viz., Bottini's operation, can probably help, nay even cure such an unfortunate patient. Surely only those who have done Bottini's operation only once or twice or not at all are the ones who condemn it.

Dr. Meyer said that so far he had not performed the modification of the Bottini operation, as proposed by Dr. Chetwood. Perhaps he was too conservative. But just as much as we were doing litholapaxy by introducing a lithotrite through the entire length of the urethra galvano-caustic prostatotomy could be successfully done in this way. He said it was true that in a few instances perineal section had become necessary later, because the galvanocautery knife had entered into the membranous urethra causing a periurethral abscess. Of course, such abscesses were not likely to develop if perineal drainage had been primarily established. However, if such an accident had occurred incision can be made in time and further injury be prevented. In many cases of large prostatic growths a finger of the usual size will not succeed in palpating very thoroughly the configuration of the gland, thus helping one in determining what should best be done for the patient at the moment. So far as drainage was concerned he was satisfied that a permanent catheter of from 15 to 19 French gauge induced through the entire length of the urethra was almost always well borne and necessary, sometimes for a number of weeks. He said that perhaps he might change his opinion regarding the modification of the original Bottini method as time advanced and that certainly Chetwood's results were gratifying and corroborated what he had said before, *i.e.*, that the Bottini operation could *not* be called a palliative procedure. He said that what would be necessary in the future would be to learn by careful analysis of every case how to indi-

vidualize in proposing operations and find out what was best to adopt in a given case. Before closing his remarks, Dr. Meyer asked that permission be given him to illustrate what he meant to say by a few cases as follows:

Case I.—A patient came from out of town; he had to work hard. He came under the speaker's care with an enlarged prostate associated with stone, and it was necessary to cure him, if possible, in one sitting. He had a very pronounced emphysema and chronic bronchitis. He did a perineal prostatectomy, removing the stone through the same incision, under spinal anesthesia with perfect success.

Case II.—Another patient in the sixties was brought to his office on account of prostatic trouble and with the statement that he and his wife were absolutely opposed to any cutting operation and that the patient was willing to continue the catheter throughout the remainder of his life if nothing else was feasible. He proposed the Bottini operation which he performed soon after. About ten weeks later, upon inquiring regarding the patient's condition the latter wrote him (he being a German), "I am famous" (famos). The catheter had been laid aside.

Case III.—A gentleman who had mining interests in the West and who traveled a great deal and who felt that he could not always have a doctor's help when needed, wanted the most radical work done. Perineal prostatectomy was proposed, accepted and performed. He now had not a drop of residual urine; now and then there was some little dribbling during night. He had some contraction at the neck of the bladder which was overcome by sounding.

Case IV.—Another patient in his sixties had a large amount of residual urine due to an enlarged prostate. Prostatectomy was proposed and accepted. Before operation a general examination of the patient revealed a pronounced valvular disease of the heart, so much so that after consultation general anesthesia as well as spinal anasthesia seemed contra-indicated. Inasmuch as the Bottini operation can be and ought to be carried out under local anesthesia that operation was proposed and done with much benefit to the patient.

Case V.—A patient, eighty-two years old, was brought to him suffering from far advanced paralysis agitans, with contracted hip-joints and absolute retention. His widowed daughter had been taught how to catheterize her father as the people were too poor to afford the continuous services of a trained male attendant. After months of faithful work the daughter had broken down and then the question came up as to what could be done for the patient. As a matter of course he was opposed to performing the Bottini operation on this patient. But the relatives insisted upon more than palliative work, being willing to take any risk. Thus Dr. Meyer reluctantly, in the summer of 1902, did a Bottini operation on this patient. A very troublesome after-treatment followed. The result was that the patient got rid of his catheter absolutely and has but very little trouble with his urinary organs. He said that truly a great boon had been conferred upon the patient and the entire family by having done Bottini's operation. The poor old man could now at least die in peace.

What the doctor wanted to bring out in writing his paper, was: *not* to discuss the uniformly recognized value of the two excellent cutting operations for prostatic enlargement, suprapubic as well as perineal, but to prove by his personal experience in 59 patients that, in especially selected cases, where prostatectomy by either route is contra-indicated or refused by the patient or his relatives, the Bottini operation must be proposed, inasmuch as it too could not only bring relief but perfect cure of the prostatic trouble.

NEW YORK PATHOLOGICAL SOCIETY.

Stated Meeting, held May 23, 1903.

The President, James Ewing, M.D., in the Chair.

The Dysentery Bacillus in a Series of Cases of Infantile Diarrhea.—Dr. Martha Wollstein read a paper on the results obtained from the examination of the stools of 114 cases for the bacillus of dysentery. The technic used was that recommended by Dr. Flexner and his pupils. The stools were obtained as fresh as possible. Where blood and mucus were present some was carefully taken on a sterile swab or platinum loop and suspended in natural broth of peptone water. From this suspension agar plates were poured at once or within an hour. Duval found that the dysentery bacillus grew more profusely on agar that is slightly acid in reaction and throughout this work such a medium was used. After the plates had been in the thermostat for twenty-four hours a number of glucose agar tubes were inoculated from them, and twenty-four hours later the gas-producing organisms were rejected. From the tubes without gas, transplants were made to plain acid agar, and then the bacilli were tested as to their reaction with serum from a horse immunized with the Flexner Manila organism.

Stools from healthy infants were examined in ten cases and dysentery bacilli were found. The stools from ten newly-born infants were also examined during a period of from twelve hours to eight days after birth. In no instance was the dysentery bacillus present. Of the 114 cases studied, the dysentery bacillus was found in 39. The ages of the children varied from five weeks to four years. The character of the stools varied greatly; blood was present in 20, usually as small specks mixed with or streaking the mucus. Many stools consisted entirely of blood and mucus. In five cases tenesmus was marked. Of the fatal cases the greater number died during the first or early in the second week. Only three lived for four weeks or more. The bacillus isolated was a short, non-motile rod with rounded ends, sometimes almost coccoid in form, growing singly or in pairs. Two cultures formed a thin pellicle in broth after five days, comparable to that described by Hiss in the case of his Bacillus "Y." Indol was formed in dextrose-free broth after three to seven days. One bacillus formed no indol and did not ferment mannite, maltose or raffinose. All the 38 other forms formed acid in the presence of mannite, raffinose, and maltose, as well as levulose, galactose and glucose. The agglutination reactions were fairly uniform and the bacilli reacted with a serum prepared from the Flexner Manila bacillus in dilutions of 1 to 50 up to 1 to 3,000; and with a serum prepared from the Shiga bacillus up to 1 to 200 only. Blood reactions were somewhat irregular. They were absent altogether in 12 cases. In six others the blood could not be obtained. In 14 good reactions were obtained. In seven cases the reaction was present only after the injection of antidysenteric sera, the blood having been negative before that time. The reactions were made with the bacilli obtained from the case, and with the stock "Harris" and "Shiga" cultures. No reaction was obtained in the blood in any case with the Shiga organism. One hour was the time limit used. The *Bacillus dysenteriæ* was not found in the heart's blood or in any viscus in five cases examined post mortem. A septicemia due to the *Bacillus dysenteriæ* seemed to be of rare occurrence.

In conclusion the speaker summed up as follows: Cases of infection with the dysentery bacillus in infants tend toward the clinical picture of dysentery, with frequent mucous and bloody stools. In some cases of hospital infection, occurring as terminal to other diseases (especially pneumonia) and in other mild cases,

the stools may never contain blood, but mucus is present in every case and usually in large amount. The serum reaction is uncertain during the first week, frequently negative after the sixth day, but may be absent for two weeks. It cannot be relied upon for early diagnostic purposes in infants and young children. The isolation of the *Bacillus dysenteriæ* from the stools is the only positive evidence of infection during life. The bacilli are present in the stools for a period of two to three weeks, but may remain for a longer time. The type of the organism almost invariably found in New York is that of the "Harris Manila" or Flexner bacillus.

The Pathological Anatomy of a Series of Cases of Infantile Diarrhea in Which the Dysentery Bacilli Were Present.—Dr. John Howland reported the results of autopsies on 17 young children suffering from infection with the *Bacillus dysenteriæ*. In the majority of cases bacteriological examinations were made antemortem; in three cases where the condition had not been suspected during life the bacteriological study was post mortem. The organisms found corresponded in all cases to what is known as the Flexner Manila or indol producing dysentery organism. In eight cases cultures were made from all the organs at autopsy; but in no case was the bacillus found except in the intestinal tract. In one case, the liver contained *Streptococci*. The other organs remained sterile or showed only the colon bacillus, with the exception of the lungs which often showed a great variety of organisms. Fifteen of these 17 children developed the infection while in institutions; two were suffering from the disease at the time of admission. The cases could be divided clinically into four classes: Acute, subacute, cured (death being due to another condition developing later) and terminal infections. There were no chronic cases. The acute cases were those which were fatal in ten days or less from the beginning of the characteristic intestinal symptoms. These cases were more apt to show blood in the stools than were the subacute cases, and were accompanied by a more marked rise in temperature, though this was not the invariable rule. There were seven acute cases in this series, one showing a pseudo-membranous enteritis; one a marked necrosis and ulcerative process; and one in which there was merely intense congestion with beginning ulceration and necrosis. The detailed study of the post-mortem findings showed that as a result of the infection with the dysentery bacillus there was a great variety in the pathological conditions found. Acute cases and terminal infections showed usually very marked congestion, more or less deep necrosis and ulceration. The cellular infiltration of the mucosa was irregular; but in general the more acute the process the more pronounced the infiltration. The same was true of the edema and infiltration of the submucosa. The infiltration of the mucosa was largely polynuclear, while in the submucosa mononuclear cells predominated. In only two cases was the muscular layer affected, and then but slightly. The peritoneal coat was involved in only one case. In one of these acutely fatal cases the lesion was what would be usually considered as subacute; that is, slight congestion, no ulceration, except through the follicles which were excavated and showed moderate hyperplasia. Of the three cases classed as subacute by reason of the duration of the disease, two exhibited the same lesions as the acute cases, though to a less degree; while in the third the hyperplasia and depression of the follicles was the prominent condition and the mucous membrane was not necrosed. Microscopical examination of the tissues for organisms gave nothing characteristic. In the necrotic areas, bacilli negative to Gram of the proper form and size were found in enormous numbers, both in the acute and in the subacute cases; but cocci and bacilli positive to Gram were also very abundant. Usually the organisms were present in considerable variety, and did not penetrate deeply into the mucosa; but in one case they were present in the superficial portion of the submucosa. Both ileum and colon were usually affected, changes in the latter being most marked. In three cases, however, the ileum suffered the most, and in one of these, a pseudomembranous case, there was hardly any change in the colon. It is interesting to compare at this time these cases with the Manila ones in adults described by Flexner, the specific germ being the same. He found the histological lesions in the mucosa to consist chiefly of coagulative necrosis with exudation of fibrin and polymorphonuclear cells. In Dr. Howland's cases the necrosis and the polynuclear cells were present but no fibrin could be demonstrated, though special staining was done for this. Flexner found the submucosa always much altered, swelling, hemorrhages, fibrinous and cellular infiltration, and he said that the changes might take place beneath an intact or almost intact mucous membrane. In contrast to this, the cases described by Dr. Howland showed no hemorrhages or fibrinous infiltration and the swelling and accumulation of cells never took place except beneath a very much altered mucous membrane. The conclusions in regard to the organisms agreed; though in one of Dr. Howland's cases bacilli were found in the submucosa where Flexner has said he never found them.

From a consideration of these 17 cases it appeared that in those terminating acutely, marked congestion, ulceration, or superficial or deep necrosis is the rule, even though the disease had lasted as short a time as two days, while in the subacute cases the changes were more catarrhal in character, with an increased follicular hyperplasia: in other words, the pathological findings were determined more by the severity of the infection than by the length of time that the disease had lasted—a severe and overwhelming infection producing destructive changes rapidly, the clinical course being correspondingly acute and short; while a less severe infection was the cause of catarrhal processes with slight destruction, the clinical course being correspondingly long.

Reaction to Different Sugars.—Dr. Philip Hanson Hiss congratulated Dr. Wollstein and Dr. Howland on the interesting reports which they had made. There were several questions which he would like to ask Dr. Wollstein. She had spoken of the organisms falling into two groups: one group similar to the Shiga bacillus, and the other large group composed of organisms able to ferment many carbohydrates—mono-, di- and poly-saccharids—with the production of acid but not of gas. He would like to know how Dr. Wollstein had made her fermentation tests and what the source of her sugars had been. In the few cases which he had had the opportunity of examining he had found two groups of organisms, leaving the Shiga type out of the question, and he considered that unless the fermentation tests were very carefully made and the purest sugars were used that this difference might not be shown. Maltose at the best was very uncertain, and all the forms of organisms if left long enough in it would probably give rise to fermentation. These two groups were distinguished from the Shiga organism by the fermentation of mannite and from each other by the fermentation, in the case of the more active fermenters, of dextrin and saccharose. The less active group fermented mannite but could not utilize dextrin and saccharose. Dr. Hiss thought the careful study and separation of these organisms very necessary because this report included a large series of cases histologically studied, and if anything was to be made out about the connection of these organisms with the different types of disease this

was the only way to do it. Dr. Hiss considered it not unlikely that in other series of cases of dysentery and diarrhea studied in this country, the organisms had not in all instances been preserved, as it had been thought, from the methods of study then used in their identification, that they were of the true Shiga and Kruse type. Hence, the frequency of occurrence of the different groups and their relation to the different types of gastro-intestinal disease in which they occurred could not now be determined. He therefore wished to ask Dr. Wollstein how she had made her fermentation tests and whether she had attempted to establish the etiological relationship of the different groups of organisms to the various types of disease which Dr. Howland had determined.

Dr. Augustus A. Wadsworth asked Dr. Howland if he had used any stain beside the Gram for demonstrating the organisms in the lesions. Were any of the tannic acid stains used?

Shiga Bacillus and Dysentery.—Dr. James Ewing said that while it was perhaps a little late to raise a question regarding the existence of infection by the bacillus of Shiga in many cases of infantile diarrhea, yet it seemed to him that the relation between the disease and the bacillus had not been fully demonstrated in these valuable papers. It seemed to be a matter of importance to know in what relative abundance the Shiga bacillus had occurred in the stools of these infants, since it was probably not the only organism in the stools. It would have been of interest to know the results of a systematic study of the serum reactions of these patients, not only on the Shiga bacillus, but on the colon bacillus and other micro-organisms which might have been isolated. Perhaps the serum of some of the patients might have proved quite as active on other bacteria of the stools as on the variety of Shiga bacillus isolated and tested. It appeared that much work of this sort was needed to definitely fix the relation of intestinal bacteria to these intestinal diseases.

Dr. Wollstein said that the sugar reactions were made with the sugars obtained from Merck and had been made in two ways. The glucose, lactose, saccharose, mannite and maltose reactions were made in fermentation tubes as well as in litmus agar prepared without meat. The other sugars were used in the sugar-free litmus agar. In regard to Dr. Ewing's remarks, Dr. Wollstein said that she did not think that it had been absolutely proven that the dysentery bacillus had been the only etiological factor in these cases and that she had therefore taken pains to call her report simply "The Dysentery Bacilli in a Series of Cases of Infantile Diarrhea." The dysentery bacillus had certainly been present in the stools of 39 cases, in greatest numbers in the cases with much mucus and blood. In the stools which contained more fecal matter they were often very few and difficult to isolate.

Dr. Hiss said in regard to the sugars, especially dextrin, that he had had specimens from Merck marked "highest purity," which in fermentation tests were little better than glucose and had acted practically as did glucose in all differential tests. Much dependence could not, therefore, be placed upon sugars bought in the open market, and it was necessary to test them thoroughly before depending upon results obtained with them.

Dr. Howland said that he had stained the bacilli with Gram-Weigert and methylene blue. He had not assumed that all these bacilli were dysentery bacilli, and had therefore called them "bacilli of the typhoid-colon form negative to Gram." Nor had he assumed that in all these cases death had been due to dysentery.

Cretinism in a Cat.—Dr. F. H. Miller presented this case because of the extreme rarity with which it was observed in veterinary medical practice, this being the first case he had seen in fifteen years of practice. The head of the animal was suppressed in growth and was very wide across the forehead in proportion to the size of the cat. There was a condition of exophthalmos which was very marked. The under jaw was about one-third short of the length of the upper jaw and the tremendous thickening of the bone made it impossible to close the mouth. There was no anchylosis. The animal showed the short limbs and overdevelopment of the muscular tissue very unlike that of the rachitical patient. Dr. Miller said that he had seen the animal for the first time when it was about two months old. While, of course, the head had since grown a great deal, it had been even at birth very abnormally large, having the great width between the eyes. The cat had been examined by several doctors and oculists, and injections of atropine into the eye had shown a great difference between it and the normal eye. The periphery of the optic nerve was very pale and the nerve disc was very markedly depressed. It was important to state that the intelligence of the cat was very subnormal. Its life was entirely a matter of comfort and taking things easily. The pelvis was normal, and the great difficulty was in the limbs from the knee and elbow-joints downward. The metacarpal bones were more or less normal. It was impossible to find any trace of the thyroids, though careful examination had been made. There was probably either obliteration or total absence of them.

Dr. Stuart Hart asked whether the thyroids were palpable in the normal cat.

Dr. Miller said that they were readily found, especially in a cat of this size. He believed that in this case they were entirely wanting. The cat could take food only with great difficulty. There was a tremendous thickening of the facial bones. The teeth were set in a semicartilaginous bone, not true bone at all.

A Case of Rhabdomyoma of the Tongue.—Dr. Harlow Brooks and Dr. Stebbins reported a case of rhabdomyoma of the tongue, which was so far as they knew the only case ever reported, the tumor being very rare in striated muscle. The patient was a Hebrew, born in Russia but resident in this country for some time. The family history was negative. Two years before he had had a broken tooth which projected and irritated his tongue on that side until it raised a small nodule which he had had cauterized and cut off with a pair of scissors. The tooth had then been taken out. After this time the enlargement had given him no trouble, though he could still feel it, until six weeks before the last removal, when it had begun to enlarge. The nodule measured about .7 cm. across, .6 cm. in width, and .3 cm. in depth. It was solid and very firm. Microscopically, it did not show the typical form of rhabdomyoma such as was generally found in the organs of the genital tract. Nearly all rhabdomyomas have originated from the organs arising from the intermediary cell mass, so that this case had a double interest. Some of the tumor cells showed striation fairly well. There was no doubt but that the cells were those of striated muscle, though most of them were of a more embryonic type. They had gone beyond the stage of unstriated muscle fibers. The case was particularly interesting because the tumor arose from an altogether different embryonal source than the ordinary rhabdomyoma.

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